Lesson 1 is an exploration in which students use stopwatches to measure time as a physical quantity. They might, for example, time how long it takes to write the fact $7 \times 8 = 56$ 40 times, or measure how long it takes to write numbers from 0 to 100. Students time their own segments as they run a relay, exploring the continuity of time by contextualizing their small segment within the number of minutes it took the whole team to run.

Lesson 2 builds students’ understanding of time as a continuous unit of measurement. This lesson draws upon the Grade 2 skill of telling time to the nearest 5 minutes (2.MD.7) and the multiplication learned in G3–M1, as students relate skip-counting by fives and telling time to the number line. They learn to draw the model, labeling hours as endpoints and multiples of 5 (shown below). Through this work, students recognize the analog clock as a portion of the number line shaped into a circle, and, from this point on, use the number line as a tool for modeling and solving problems (MP.5).

![Number line model](image)

Lesson 3 increases students’ level of precision to the nearest minute as they read and write time. Students draw number line models that represent the minutes between multiples of 5, learning to count by fives and...
some ones as a strategy that they quickly apply to reading time to the nearest minute on the clock (number line model shown below). In preparation for Lessons 4 and 5, they make a first, simple use of counting on the number line and clock to add minutes. For example, they might use the count by fives and some ones strategy to locate 17 minutes, and then keep counting to find 4 minutes more.

In Lesson 4, students begin measuring time intervals in minutes within 1 hour to solve word problems. They reinforce their understanding of time as a continuous unit of measurement by counting forward and backward using the number line and the clock. They might solve, for example, a problem such as, “Beth leaves her house at 8:05 a.m. and arrives at school at 8:27 a.m. How many minutes does Beth spend traveling to school?”

Lesson 5 carries problem solving with time a step further. Students measure minute intervals and then add and subtract the intervals to solve problems. Students might solve problems such as, “I practiced the piano for 25 minutes and the clarinet for 30 minutes. How long did I spend practicing my instruments?” Calculations with time in this lesson—and throughout Grade 3—never cross over an hour or involve students converting between hours and minutes.

### A Teaching Sequence Towards Mastery of Time Measurement and Problem Solving

<table>
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<th>Objective 1:</th>
<th>Explore time as a continuous measurement using a stopwatch. (Lesson 1)</th>
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<td>Objective 2:</td>
<td>Relate skip-counting by 5 on the clock and telling timing to a continuous measurement model, the number line. (Lesson 2)</td>
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<td>Objective 3:</td>
<td>Count by fives and ones on the number line as a strategy to tell time to the nearest minute on the clock. (Lesson 3)</td>
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<td>Objective 4:</td>
<td>Solve word problems involving time intervals within 1 hour by counting backward and forward using the number line and clock. (Lesson 4)</td>
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<tr>
<td>Objective 5:</td>
<td>Solve word problems involving time intervals within 1 hour by adding and subtracting on the number line. (Lesson 5)</td>
</tr>
</tbody>
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Lesson 1

Objective: Explore time as a continuous measurement using a stopwatch.

Suggested Lesson Structure

- Fluency Practice: (12 minutes)
- Application Problem: (5 minutes)
- Concept Development: (33 minutes)
- Student Debrief: (10 minutes)
- Total Time: (60 minutes)

Fluency Practice (12 minutes)

- Tell Time on the Clock 2.MD.7 (3 minutes)
- Minute Counting 3.MD.1 (6 minutes)
- Group Counting 3.OA.1 (3 minutes)

Tell Time on the Clock (3 minutes)

Materials: (T) Analog clock for demonstration  (S) Personal whiteboards

Note: This activity reviews the Grade 2 standard of telling and writing time to the nearest 5 minutes. It prepares students to count by 5-minute intervals on the number line and clock in Lesson 2.

T: (Show an analog demonstration clock.) Start at 12 and count by 5 minutes on the clock. (Move finger from 12 to 1, 2, 3, 4, etc., as students count.)

S: 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60.

T: I’ll show a time on the clock. Write the time on your board. (Show 11:10.)

S: (Write 11:10.)

T: (Show 6:30.)

S: (Write 6:30.)

Repeat process, varying the hour and 5-minute interval so that students read and write a variety of times to the nearest 5 minutes.
Lesson 1

NYS COMMON CORE MATHEMATICS CURRICULUM

Lesson 1

Minute Counting (6 minutes)

Note: This activity reviews the Grade 2 standard of telling and writing time to the nearest 5 minutes. It prepares students to count by 5-minute intervals on the number line and clock in Lesson 2. Students also practice group counting strategies for multiplication in the context of time.

T: There are 60 minutes in 1 hour. Count by 5 minutes to 1 hour.
S: 5 minutes, 10 minutes, 15 minutes, 20 minutes, 25 minutes, 30 minutes, 35 minutes, 40 minutes, 45 minutes, 50 minutes, 55 minutes, 60 minutes. (Underneath 60 minutes, write 1 hour.)
T: How many minutes are in a half-hour?
S: 30 minutes.
T: Count by 5 minutes to 1 hour. This time, say half-hour when you get to 30 minutes.

Repeat the process using the following suggested sequences:
- Count by 10 minutes and 6 minutes to 1 hour.
- Count by 3 minutes to a half hour.

Group Counting (3 minutes)

Note: Group counting reviews interpreting multiplication as repeated addition. Counting by sevens, eights, and nines in this activity anticipates multiplication using those units in Module 3.

Direct students to count forward and backward using the following suggested sequences, occasionally changing the direction of the count:
- Sevens to 28
- Eights to 32
- Nines to 36

Application Problem (5 minutes)

Ms. Bower helps her kindergartners tie their shoes. It takes her 5 seconds to tie 1 shoe. How many seconds does it take Ms. Bower to tie 8 shoes?

\[ 8 \times 5 \text{ seconds} = 40 \text{ seconds} \]

It takes Ms. Bower 40 seconds to tie 8 shoes.

Note: This reviews multiplication from Module 1 and gets students thinking about how long it takes to complete an activity or task. It leads into the Concept Development by previewing the idea of seconds as a unit of time. Note on standards alignment: The standards introduce seconds in Grade 4.
Concept Development (33 minutes)

Materials: (T) Stopwatch and classroom clock (S) Stopwatch and personal white boards

Part 1: Explore seconds as a unit of time.

T: It takes Ms. Bower 5 seconds to tie one shoe. Does it take a very long time to tie a shoe?
S: No!
T: Let’s see how long a second is. (Let the stopwatch tick off a second.)
T: It’s a short amount of time! Let’s see how long 5 seconds is so we know how long it takes Ms. Bower to tie 1 shoe. (Let the stopwatch go for 5 seconds.)
T: Let’s see how long 40 seconds lasts. That’s the amount of time it takes Ms. Bower to tie 8 shoes. (Let the stopwatch go for 40 seconds.) Tell the count at each 5 seconds.
S: (Watch the stopwatch.) 5! 10! 15, etc.
T: **Seconds** are a unit of time. They’re smaller than minutes so we can use them to measure short amounts of time.
T: What are other things we might measure using seconds? (Students discuss.)
T: Turn and tell your partner how many seconds you estimate it takes us to walk from the carpet to sit in our seats.
T: Let’s use the stopwatch to measure. Go!
T: It took us ____ seconds. Use mental math to compare your estimate with the real time. How close were you? (Select a few students to share.)
T: (Display stopwatch.) The tool I’m using to measure seconds is called a stopwatch. We can start it and stop it to measure how much time passes by. It has two buttons. The button on the right is the start button, and the one on the left is the stop/reset button.
T: When we stopped the stopwatch, did time stop, or did we just stop measuring?
S: Time didn’t stop. → We stopped measuring time by hitting the stop button. → Time keeps going. We only stopped measuring.
T: Time is **continuous**. Continuous means time does not stop but is always moving forward. We just use stopwatches and clocks to measure its movement.
T: Partner 1, measure and write how long it takes Partner 2 to draw a 2 by 5 array on her personal board.
S: (Partner 1 times, and Partner 2 draws. Partner 1 writes unit form, e.g., 8 seconds.)
Students repeat the process alternating the partner who times the following suggested activities:

- Skip-counting by fives up to 60.
- Drawing a 6 by 10 array.

**Part 2: Students explore minutes as a unit of time.**

T: I look at the clock and notice that ___ minutes have passed since we walked from our tables to the carpet.

T: **Minutes** are longer than seconds. Let’s find out what the length of a minute feels like. Sit quietly and measure a minute with your stopwatch. Go!

S: (Watch the stopwatch until 1 minute passes.)

T: What does a minute feel like?

S: It is much longer than 1 second!

T: Now I’ll time 1 minute. You turn and talk to your partner about your favorite game. Let’s see if the length of 1 minute feels the same. (Time students talking.)

T: Did 1 minute feel faster or slower than when you were just watching the clock?

S: It seemed so much faster! Talking was fun!

T: How long a minute feels can change depending on what we’re doing, but the measurement always stays the same. What are some other things we might use minutes to measure?

S: (Discuss.)

Student pairs take turns using a stopwatch to measure how long it takes them to do the following:

- Touch their toes and raise their hands over their heads 30 times.
- Draw 1 by 1, 2 by 2, 3 by 3, 4 by 4, and 5 by 5 arrays.

**Part 3: Explore time as a continuous measurement.**

T: We can use the stopwatch to start measuring how many minutes it takes to get dark outside. Will it take a long time?

S: Yes!

T: (Start stopwatch and wait impatiently.) Should I keep measuring? (Let students react.)

T: (Stop stopwatch.) Imagine that I measure how long it takes for all the students in this class to turn 10 years old. Is a stopwatch a good tool for measuring such a long amount of time?

S: No! It’s better for measuring an amount of time that is not very long.

T: Time keeps going and going, and a stopwatch just captures a few seconds or minutes of it along the way.
Lesson 1

Explore time as a continuous measurement using a stopwatch.

Date: 7/4/13

Problem Set (10 minutes)

Students should do their personal best to complete the Problem Set within the allotted 10 minutes. Some problems do not specify a method for solving. This is an intentional reduction of scaffolding that invokes MP.5, Use Appropriate Tools Strategically. Students should solve these problems using the RDW approach used for Application Problems.

For some classes, it may be appropriate to modify the assignment by specifying which problems students should work on first. With this option, let the careful sequencing of the problem set guide your selections so that problems continue to be scaffolded. Balance word problems with other problem types to ensure a range of practice. Assign incomplete problems for homework or at another time during the day.

Student Debrief (10 minutes)

Lesson Objective: Explore time as a continuous measurement using a stopwatch.

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.

- What pattern did you notice in Problem 5?
- Explain to your partner why the activities in Problem 5 didn’t take that long to complete.
- Did it take you longer to complete Problem 1 or Problem 4? Why?
- Why do we use a stopwatch?
- Seconds and minutes are units we use to measure time. How are they different?
- Does time stop when we stop measuring time with our stopwatch? Use the word continuous to talk over why or why not with your partner.
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.
Lesson 1 Problem Set

Name ____________________________ Date ______________

1. Use a stop watch. How long does it take you to snap your fingers 10 times?

2. Use a stopwatch. How long does it take to write every number from 0–25?

   It takes _____________ to snap 10 times.
   It takes __________ to write every number from 0-25.

3. Use a stopwatch. How long does it take you to name 10 animals? Record them below.

   It took ___________ to name 10 animals.

4. Use a stopwatch. How long does it take you to write, “7 × 8 = 56” 15 times? Record the time below.

   It took _____________ to write the equation 15 times.

Lesson 1: Explore time as a continuous measurement using a stopwatch.
5. Work with your group. Use a stopwatch to measure the time for each of the following activities.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Write your full name.</td>
<td>____________ seconds</td>
</tr>
<tr>
<td>Do 20 jumping jacks.</td>
<td></td>
</tr>
<tr>
<td>Whisper count by twos from 0 to 30.</td>
<td></td>
</tr>
<tr>
<td>Draw 8 squares.</td>
<td></td>
</tr>
<tr>
<td>Skip-count out loud by fours from 24 to 0.</td>
<td></td>
</tr>
<tr>
<td>Say the names of your teachers from Kindergarten to Grade 3.</td>
<td></td>
</tr>
</tbody>
</table>

6. 100 meter relay: Use a stopwatch to measure and record your time.

<table>
<thead>
<tr>
<th>Name</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Total time:
The table to the right shows the times that 5 students took to do 15 jumping jacks.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Maya</td>
<td>16 seconds</td>
</tr>
<tr>
<td>Riley</td>
<td>15 seconds</td>
</tr>
<tr>
<td>Jake</td>
<td>14 seconds</td>
</tr>
<tr>
<td>Nicholas</td>
<td>15 seconds</td>
</tr>
<tr>
<td>Adeline</td>
<td>17 seconds</td>
</tr>
</tbody>
</table>

a. Who finished their jumping jacks the fastest?

b. Who finished their jumping jacks in the exact same amount of time?

c. How many seconds faster did Jake finish than Adeline?
Lesson 1 Homework

Name _________________________________  Date _____________________

1. The table below shows the times 5 students took to run 100 meters.

<table>
<thead>
<tr>
<th>Student</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Samantha</td>
<td>19 seconds</td>
</tr>
<tr>
<td>Melanie</td>
<td>22 seconds</td>
</tr>
<tr>
<td>Chester</td>
<td>26 seconds</td>
</tr>
<tr>
<td>Dominique</td>
<td>18 seconds</td>
</tr>
<tr>
<td>Louie</td>
<td>24 seconds</td>
</tr>
</tbody>
</table>

a. Who is the fastest runner?

b. Who is the slowest runner?

c. How many seconds faster does Samantha run than Louie?

2. List activities at home that take the following times to complete. If you do not have a stopwatch, you can use the strategy of counting by “1 Mississippi, 2 Mississippi, 3 Mississippi....”

<table>
<thead>
<tr>
<th>Time</th>
<th>Activities at home</th>
</tr>
</thead>
<tbody>
<tr>
<td>30 seconds</td>
<td>For example: Tying shoelaces</td>
</tr>
<tr>
<td>45 seconds</td>
<td></td>
</tr>
<tr>
<td>60 seconds</td>
<td></td>
</tr>
</tbody>
</table>
3. Match the analog clock with the correct digital clock.

- Analog clock 1
  - Digital clock: 07:05

- Analog clock 2
  - Digital clock: 11:00

- Analog clock 3
  - Digital clock: 10:15

- Analog clock 4
  - Digital clock: 02:50
Lesson 2

Objective: Relate skip-counting by 5 on the clock and telling time to a continuous measurement model, the number line.

Suggested Lesson Structure

- Fluency Practice (12 minutes)
- Application Problem (5 minutes)
- Concept Development (33 minutes)
- Student Debrief (10 minutes)
- Total Time (60 minutes)

Fluency Practice (12 minutes)

- Group Counting 3.OA.1 (3 minutes)
- Tell Time on the Clock 2.MD.7 (3 minutes)
- Minute Counting 3.MD.1 (6 minutes)

Group Counting (3 minutes)

Note: Group counting reviews interpreting multiplication as repeated addition. Counting by sevens and eights in this activity anticipates multiplication using those units in Module 3.

Direct students to count forward and backward using the following suggested sequence, occasionally changing the direction of the count:

- Sevens to 35, emphasizing the transition of 28 to 35
- Eights to 40, emphasizing the transition of 32 to 40

Tell Time on the Clock (3 minutes)

Materials: (T) Analog clock for demonstration (S) Personal white boards

Note: This activity reviews the Grade 2 standard of telling and writing time to the nearest 5 minutes. It prepares students to use the number line and clock to tell time to the nearest 5 minutes in the Concept Development.

T: (Show an analog demonstration clock.) Start at 12 and count by 5 minutes on the clock.
   (Move finger from 12 to 1, 2, 3, 4, etc., as students count.)
S: 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60.
T: I’ll show a time on the clock. Write the time on your board. (Show 3:05.)
S: (Write 3:05.)
T: (Show 2:35.)
S: (Write 2:35.)

Repeat process, varying the hour and 5-minute interval so that students read and write a variety of times to the nearest 5 minutes.

**Minute Counting (6 minutes)**

Note: This activity reviews the Grade 2 standard of telling and writing time to the nearest 5 minutes. It prepares students to count by 5-minute intervals on the number line and clock in the Concept Development. Students also practice group counting strategies for multiplication in the context of time.

Use the process outlined for this activity in G3–M2–Lesson 1. Direct students to count by 5 minutes to 1 hour, to the half hour, and quarter hours. Repeat the process using the following suggested sequence for count-by:

- 6 minutes, counting to the hour and half hour
- 3 minutes, counting to a quarter past the hour and half hour
- 10 minutes, counting up to 1 hour
- 9 minutes, counting to 45 and emphasizing the transition of 36 to 45

**Application Problem (5 minutes)**

Christine has 12 math problems for homework. It takes her 5 minutes to complete each problem. How many minutes does it take Christine to finish all 12 problems?

\[
\begin{align*}
12 \times 5 \text{ minutes} &= 60 \text{ minutes} \\
\text{It takes Christine 60 minutes to finish her homework.}
\end{align*}
\]

Note: This problem anticipates the Concept Development. It activates prior knowledge from Grade 2 about math with minutes. Twelve is a new factor. If students are unsure about how to multiply 12 groups of 5, encourage them to solve by skip-counting. They can also use the distributive property, 10 fives + 2 fives or 6 fives + 6 fives. Students use the solution to this problem as a springboard for modeling 12 intervals of 5 minutes on the number line in the Concept Development.
Lesson 2: Relate skip-counting by 5 on the clock and telling time to a continuous measurement model, the number line.

Date: 7/4/13

Concept Development (33 minutes)

Materials: (T) Demonstration analog clock  (S) Personal white board, two-sided Tape Diagram/Clock Template (pictured below), centimeter ruler

Part 1: Draw a number line and relate skip-counting by fives to skip-counting intervals of 5 minutes.

(Place tape diagram templates in personal white boards.)

T: Model the application problem using the tape diagram on the template. (Students model.)

Guide discussion so that students articulate the following: the tape diagram is divided into 12 parts, each part represents the time it takes Christine to do 1 math problem, the tape diagram represents a total of 60 minutes.

T: A different way to model this problem is to use a number line. Let’s use our tape diagram to help us draw a number line that represents a total of 60 minutes.

T: Draw a line a few centimeters below the tape diagram. Make it the same length as the tape diagram. Make tick marks on the number line where units are divided on the tape diagram. (Model each step as students follow along.)

T: What do you notice about the relationship between the tape diagram and the number line?
S: The lines are in the same place. → They have the same number of parts.

T: What part of the tape diagram do the spaces between tick marks represent?
S: The units. → The time it takes to do each math problem. → They each represent 5 minutes.

T: We know from yesterday that time doesn’t stop. It was happening before Christine started her homework, and it keeps going after she’s finished. To show that time is continuous, we’ll extend our number line on both sides and add arrows to it. (Model.)

S: (Extend number lines and add arrows.)

T: Let’s label our number lines. The space between 2 tick marks represents a 5 minute interval. Write 0 under the first tick mark on the left. Then skip-count by fives. As you count, write each number under the next tick mark. Stop when you’ve labeled 60. (Model, students follow along.)

T: The space between 2 marks represents one 5 minute interval. How many minutes are in the interval from 0 to 10? From 0 to 60? From 15 to 30?
S: From 0 to 10 is 10 minutes, from 0 to 60 is 60 minutes, and from 15 to 30 is 15 minutes.

T: Let’s use the number line to find how many minutes it takes Christine to do 4 math problems. (Place finger at 0. Move to 5, 10, 15, and 20 as you count 1 problem, 2 problems, 3 problems, 4 problems.) It takes Christine 20 minutes to do 4 math problems. Use the word interval to explain to your partner how I used the number line to figure that out.
S: (Discuss.)

(Use guided practice to find how long it takes Christine to solve 7, 9, and 11 problems.)
Part 2: Use a number line to tell time to the nearest 5 minutes within 1 hour.

T: Use your ruler to draw a 12-centimeter number line. (Model as students follow along.)
T: How many 5 minute intervals will the number line need to represent a total of 60 minutes?
S: Twelve!
T: Marking 12 equally spaced intervals is difficult! How can the ruler help do that?
S: It has 12 centimeters. → The centimeters show us where to draw tick marks.
T: Use the centimeters on your ruler to draw tick marks for the number line. (Model.)
S: (Use rulers to draw tick marks.)
T: Just like on the first number line, we’ll need to show that time is continuous. Extend each side of your number line and make arrows. Then skip-count to label each 5 minute interval starting with 0 and ending with 60. (Model while students follow along.)

T: How many minutes are labeled on our number line?
S: 60 minutes.
T: There are 60 minutes between 1:00 p.m. and 2:00 p.m. Let’s use the number line to model exactly when we will do the activities on our schedule that happen between 1:00 p.m. and 2:00 p.m.
T: Below the 0 tick mark, write 1:00 p.m. Below the 60 tick mark, write 2:00 p.m. (Model.)
S: (Label as shown below.)

T: Now this number line shows the hour between 1:00 p.m. and 2:00 p.m.
T: We start recess at 1:10 p.m. Is that time between 1:00 p.m. and 2:00 p.m.? (Students agree.)
T: To find that spot on the number line, I’ll put my finger on 1:00 and move it to the right as I skip-count intervals until I reach 1:10. Remind me, what are we counting by?
S: Fives!
T: (Model, with students chorally counting along.)
Lesson 2

NOTES ON MULTIPLE MEANS OF ACTION AND EXPRESSION:

Part 3: Relate the number line to the clock and tell time to the nearest 5 minutes.

Students have clock templates ready. Display a clock face without hands.

T: We counted by fives to plot minutes on a number line, and we’ll do the same on a clock.

T: How many 5-minute intervals show 15 minutes on a clock?

S: 3 intervals.

T: We started at 0 on the number line, but a clock has no 0. Where is the starting point on a clock?

S: The 12.

T: Let’s count each 5-minute interval and plot a point on the clock to show 15 minutes. (Model.)

Options for further practice:

- Plot 30 minutes, 45 minutes, and 55 minutes using the process above.
- Write 9:15 a.m., 3:30 p.m., and 7:50 a.m. on the board as they would appear on a digital clock, or say the time rather than write it. Students copy each time, plot points, and draw hands to show that time. (Model drawing hands with 10:20 a.m.)
Lesson 2

NYS COMMON CORE MATHEMATICS CURRICULUM

Lesson 2

Problem Set (10 minutes)

Students should do their personal best to complete the Problem Set within the allotted 10 minutes. For some classes, it may be appropriate to modify the assignment by specifying which problems students work on first. Some problems do not specify a method for solving. Students solve these problems using the RDW approach used for Application Problems.

Student Debrief (10 minutes)

Lesson Objective: Relate skip-counting by 5 on the clock and telling time to a continuous measurement model, the number line.

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.

- In Problem 2, what information was important for plotting the point on the number line that matched the time shown on each clock?
- Each interval on the analog clock is labeled with the numbers 1–12. Compare those with our labels from 0 to 60 on the number line. What do the labels represent on both tools?
- How does multiplication using units of 5 help you read or measure time?
- Students may have different answers for Problem 4 (11:25 p.m. may come before or after 11:20 a.m.). Allow students with either answer a chance to explain their thinking.
- How did our minute counting and time telling activities in today’s fluency help you with the rest of the lesson?
Look at the number line used for Problem 2. Where do you think 5:38 would be? (This anticipates Lesson 3 by counting by fives and then ones on a number line.)

**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.
1. Follow the directions to label the number line below.

a. Ingrid gets ready for school between 7:00 a.m. and 8:00 a.m. Label the first and last tick marks as 7:00 a.m. and 8:00 a.m.

b. Each interval represents 5 minutes. Count by fives starting at 0, or 7:00 a.m. Label 0, 5, and 10 below the number line up to 8:00 a.m.

c. Ingrid starts getting dressed at 7:10 a.m. Plot a point on the number line to represent this time. Above the point write D.

d. Ingrid starts eating breakfast at 7:35 a.m. Plot a point on the number line to represent this time. Above the point write E.

e. Ingrid starts brushing her teeth at 7:40 a.m. Plot a point on the number line to represent this time. Above the point write T.

f. Ingrid starts packing her lunch at 7:45 a.m. Plot a point on the number line to represent this time. Above the point write L.

g. Ingrid starts waiting for the bus at 7:55 a.m. Plot a point on the number line to represent this time. Above the point write W.
2. Label every 5 minutes below the number line shown. Draw a line from the clocks to the points on the number line showing their time. Not all of the clocks have matching points.

![Clocks and number line](image)

3. Noah uses a number line to locate 5:45 p.m. Each interval is 5 minutes. The number line shows the hour from 5 p.m. to 6 p.m. Label the number line below to show his work below.

![Number line](image)

4. Tanner tells his little brother that 11:25 p.m. comes after 11:20 a.m. Do you agree with Tanner? Why or why not?
Name ___________________________________________ Date __________________

The number line below shows math class from 10:00 a.m. to 11:00 a.m. Use the number line to answer the following questions.

10:00 a.m. 11:00 a.m.

a. What time do Sprints begin?

b. What time do students begin Application Problems?

c. What time do students work on Exit Tickets?

d. How long is math class?
1. Follow the directions to label the number line below.

   a. The basketball team practices between 4:00 p.m. and 5:00 p.m. Label the first and last tick marks as 4:00 p.m. and 5:00 p.m.

   b. Each interval represents 5 minutes. Count by fives starting at 0, or 4:00 p.m. Label 0, 5, and 10 below the number line up to 5:00 p.m.

   c. The team warms up at 4:05 p.m. Plot a point on the number line to represent this time. Above the point write W.

   d. The team shoots free throws at 4:15 p.m. Plot a point on the number line to represent this time. Above the point write F.

   e. The team plays a practice game at 4:25 p.m. Plot a point on the number line to represent this time. Above the point write G.

   f. The team has a water break at 4:50 p.m. Plot a point on the number line to represent this time. Above the point write B.

   g. The team reviews their plays at 4:55 p.m. Plot a point on the number line to represent this time. Above the point write P.
Lesson 2: Relate skip-counting by 5 on the clock and telling time to a continuous measurement model, the number line.

Date: 7/4/13
Side B: Clock Template
Lesson 3

Objective: Count by fives and ones on the number line as a strategy to tell time to the nearest minute on the clock.

Suggested Lesson Structure

- Fluency Practice           (15 minutes)
- Application Problem        (5 minutes)
- Concept Development        (30 minutes)
- Student Debrief            (10 minutes)

Total Time                   (60 minutes)

Fluency Practice (15 minutes)

- Tell Time on the Clock     2.MD.7  (3 minutes)
- Decompose 60 Minutes       3.MD.1  (6 minutes)
- Minute Counting            3.MD.1  (3 minutes)
- Group Counting             3.OA.1  (3 minutes)

Tell Time on the Clock (3 minutes)

Materials: (T) Analog clock for demonstration (S) Personal white boards

Note: This activity reviews the Grade 2 standard of telling and writing time to the nearest 5 minutes. It reviews Lesson 2 and prepares students to count by 5 minutes and some ones in this lesson.

T: (Show an analog demonstration clock.) Start at 12 and count by 5 minutes on the clock.
   (Move finger from 12 to 1, 2, 3, 4, etc., as students count.)
S: 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60.
T: I’ll show a time on the clock. Write the time on your board. (Show 4:00.)
S: (Write 4:00.)
T: (Show 4:15.)
S: (Write 4:15.)

Repeat process, varying the hour and 5-minute interval so that students read and write a variety of times to the nearest 5 minutes.
Decompose 60 Minutes (6 minutes)

Materials: (S) Personal white boards

Note: Decomposing 60 minutes using a number bond helps students relate part–whole thinking to telling time.

T: (Project a number bond with 60 minutes written as the whole.) There are 60 minutes in 1 hour.
T: (Write 50 minutes as one of the parts.) On your boards, draw my number bond and complete the missing part.
S: (Draw number bond with 10 minutes completing the missing part.)

Repeat the process for 30 minutes, 40 minutes, 45 minutes, and 35 minutes.

Minute Counting (3 minutes)

Note: Students practice counting strategies for multiplication in the context of time. This activity prepares students for telling time to the nearest minute and builds skills for using mental math to add and subtract minute intervals in Lesson 5.

Use the process outlined for this activity in G3–M2–Lesson 1. Direct students to count by 5 minutes to 1 hour, and then to the half hour and quarter hours.

- 6 minutes, counting to 1 hour, and naming half hour and 1 hour intervals as such
- 3 minutes, counting to 30 minutes, and naming the quarter hour and half hour intervals as such
- 9 minutes, counting to quarter ‘til 1 hour
- 10 minutes, using the following sequence: 10 minutes, 20 minutes, 1 half hour, 40 minutes, 50 minutes, 1 hour

Group Counting (3 minutes)

Notes: Group counting reviews the interpretation of multiplication as repeated addition. Counting by sevens, eights, and nines in this activity anticipates multiplication using those units in Module 3.

Direct students to count forward and backward using the following suggested sequences, occasionally changing the direction of the count:

- Sevens to 42, emphasizing the 35 to 42 transition
- Eights to 48, emphasizing the 40 to 48 transition
- Nines to 54, emphasizing the 45 to 54 transition
Application Problem (5 minutes)

There are 12 tables in the cafeteria. Five students sit at each of the first 11 tables. Three students sit at the last table. How many students are sitting at the 12 tables in the cafeteria?

Note: This problem activates prior knowledge from Module 1 about multiplying by 5. Students relate modeling on the number line to the application problem in the Concept Development.

Concept Development (30 minutes)

Materials: (T) Demonstration analog clock (S) Personal white boards, centimeter ruler, Side A: Number Line/Clock Template (pictured right)

Problem 1: Count minutes by fives and ones on a number line.

T: Use your ruler to draw a 12 centimeter line on your personal white board. Start at the 0 mark and make a tick mark at each centimeter up to the number 12. Label the first tick mark 0 and the last tick mark 60. Then count by fives from 0 to 60 to label each interval, like we did yesterday.

S: (Draw and label a number line as shown.)

T: Put your finger on 0. Count by ones from 0 to 5. What numbers did you count between 0 and 5?

S: 1, 2, 3, and 4.

T: We could draw tick marks but let’s instead imagine they are there. Can you see them?

S: Yes!

T: Put your finger on 5. Count on by ones from 5 to 10. What numbers did you count between 5 and 10?

S: 6, 7, 8, and 9.

T: Can you imagine those tick marks, too?

S: Yes!

NOTES ON MULTIPLE MEANS OF ACTION AND EXPRESSION:

Use preprinted number lines for students with fine motor skill or perception difficulties. You can also have students actually draw all the tick marks, but be aware this may encourage counting all when the objective is to count by fives and ones.
Lesson 3

Count by fives and ones on the number line as a strategy to tell time to the nearest minute on the clock.

Date: 7/4/13

T: Let’s find 58 minutes on the number line. Put your finger on 0. Count by fives to 55.
S: (Count 11 fives.)
T: Let’s draw the tick marks from 55 to 60. Count with me as I draw the missing tick marks from 55 to 60. Start at 55, which is already there.
S: 55, (begin drawing) 56, 57, 58, 59 (stop drawing), 60.
T: How many ticks did I draw?
S: 4.
T: Go ahead and draw yours. (Students draw.)
T: Count on by ones to find 58 using the tick marks we made in the interval between 55 and 60.

S: (Count on by ones and say numbers out loud.) 56, 57, 58.
T: How many fives did we count?
S: Eleven.
T: How many ones did we count?
S: 3.
T: 11 fives + 3. How can we write that as multiplication? Discuss with your partner.
S: (11 × 5) + 3.
T: Discuss with a partner how our modeling with the number line relates to the Application Problem.
S: (Discuss.)

Repeat the process with other combinations of fives and ones, such as (4 × 5) + 2 and (0 × 5) + 4.

T: What units did we count by on the number line to solve these problems?
S: Fives and ones.
T: Whisper to your partner, what steps did we take to solve these problems on the number line?
S: (Discuss.)

Problem 2: Count by fives and ones on a number line to tell time to the nearest minute.

T: I arrived at school this morning at 7:37 a.m. Let’s find that time on our number line. Label 7:00 a.m. above the 0 mark and 8:00 a.m. above the 60 mark.
S: (Label 7:00 a.m. and 8:00 a.m.)
T: Which units should we count by to get to 7:37?
S: Count by fives to 7:35 and then by ones to 7:37.
T: How many fives?
S: 7.
T: How many ones?
S: 2 ones.
T: "Let's move our fingers over 7 fives and 2 ones on the number line."
Lesson 3: Count by fives and ones on the number line as a strategy to tell time to the nearest minute on the clock.

Date: 7/4/13

S: (Move fingers and count.)
T: Give me a multiplication sentence.
S: \((7 \times 5) + 2 = 37\).
T: Plot the point on your number line.

Repeat the process with other times that can be plotted on this same number line, such as 7:13 a.m., 7:49 a.m., and 7:02 a.m.

Problem 3: Count by fives and ones on a clock to tell time to the nearest minute.

T: Insert the Clock Template in your personal white board. How is the clock similar to our number line?
S: There are 4 tick marks between the numbers on both. \(\rightarrow\) They both have intervals of 5 with 4 marks in between.
T: What do the small tick marks represent on the clock?
S: Ones. \(\rightarrow\) One minute!
T: We can use a clock just like we use a number line to tell time, because a clock is a circular number line. Imagine twisting our number line into a circle. In your mind’s eye, at what number do the ends of your number line connect?
S: At the 12.
T: The 12 on the clock represents the end of one hour and the beginning of another.
T: (Project analog clock and draw hands as shown.) This clock shows what time I woke up this morning. Draw the minute hand on your clock to look like mine.
S: (Draw hand on Clock Templates.)
T: Let’s find the minutes by counting by fives and ones. Put your finger on the 12—the zero—and count by fives with me.
S: (Move finger along clock and count by fives to 45.)
T: (Stop at 45.) How many minutes?
S: 45.
T: Let’s count on by ones until we get to the minute hand. Move your finger and count on with me.
S: 46, 47, 48. (Move finger and count on by ones.)
T: How many minutes?
S: 48.
T: Draw the hour hand. How many hours?
S: 5.
Lesson 3

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Lesson Objective: Count by fives and ones on the number line as a strategy to tell time to the nearest minute on the clock.

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.

- Look at Problem 1. Talk to a partner, how is the number line similar to the analog clock? How is it different?
- What strategy did you use to draw the hands on the clock in Problem 3?

Problem Set (10 minutes)

Students should do their personal best to complete the Problem Set within the allotted 10 minutes. 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 solve these problems using the RDW approach used for Application Problems.

Student Debrief (10 minutes)

T: What is the time?
S: 5:48 a.m.
T: Write the time on your personal white boards.
S: (Write 5:48 a.m.)

Repeat the process of telling time to the nearest minute, providing a small context for each example.

Use the following suggested sequence: 12:14 a.m., 2:28 p.m.

T: Can anyone share another strategy they used to tell the time on the clock for 2:28 p.m. other than counting by fives and ones from the 0 minute mark?
S: I started at 2:30 p.m. and counted back 2 minutes to get to 2:28 p.m.
- Look at Problem 4. How many fives did you count by? Write a multiplication equation to show that. How many ones did you count on by? Write a multiplication equation to show that. Add the totals together. How many minutes altogether?
- How does the tape diagram that many of us drew to solve the Application Problem relate to the first number line we drew in the Concept Development?
- Look at Problem 5. Can anyone share another strategy they used to tell the time on the clock other than counting by fives and ones from the 0 minute mark?
- (In anticipation of Lesson 4, which involves solving word problems with time intervals, have students discuss Problem 5(b).) How is Problem 5(b) different from the rest of the problems? How can you solve Problem 5(b)?

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.
1. Plot a point on the number line for the times shown on the clocks below. Then draw a line to match the clocks to the points.

2. Jessie woke up this morning at 6:48 a.m. Draw hands on the clock below to show what time Jessie woke up.

3. Mrs. Barnes starts teaching math at 8:23 a.m. Draw hands on the clock below to show what time Mrs. Barnes starts teaching math.
4. The clock shows what time Rebecca finishes her homework. What time does Rebecca finish her homework?

Rebecca finishes her homework at _______________.

5. The clock below shows what time Mason's mom drops him off for practice.
   a. What time does Mason's mom drop him off?

   b. Mason’s coach arrived 11 minutes before Mason. What time did Mason’s coach arrive?
Name ____________________________ Date ________________

The clock shows what time Jason gets to school in the morning.

a. What time does Jason get to school?

b. The first bell rings at 8:23. Draw hands on the clock to show when the bell rings.

c. Label the first and last tick marks 8:00 a.m. and 9:00 a.m. Plot a point to show when Jason arrives at school. Label it A. Plot a point on the line when the first bell rings and label it B.
Lesson 3 Homework

Name ________________________________ Date __________________

1. Plot points on the number line for each time shown on a clock below. Then draw lines to match the clocks to the points.

![Clocks and number line](image)

2. Julie eats dinner at 6:07 p.m. Draw hands on the clock below to show what time Julie eats dinner.

![Clock](image)

3. P.E. starts at 1:32 p.m. Draw hands on the clock below to show what time P.E. starts.

![Clock](image)
4. The clock shows what time Zachary starts playing with his action figures.

   a. What time does he start playing with his action figures?

   b. He plays with his action figures for 23 minutes. What time does he finish playing?

   c. Draw hands on the clock to the right to show what time Zachary finishes playing.

   d. Label the first and last tick marks with 2:00 p.m. and 3:00 p.m. Then plot Zachary’s start and finish times. Label his start time with a B and his finish time with an F.
Lesson 3: Count by fives and ones on the number line as a strategy to tell time to the nearest minute on the clock.

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Lesson 3:
Count by fives and ones on the number line as a strategy to tell time to the nearest minute on the clock.

Date: 7/4/13
Lesson 4

Objective: Solve word problems involving time intervals within 1 hour by counting backward and forward using the number line and clock.

Suggested Lesson Structure

- Fluency Practice (12 minutes)
- Application Problem (5 minutes)
- Concept Development (33 minutes)
- Student Debrief (10 minutes)

Total Time (60 minutes)

Fluency Practice (12 minutes)

- Group Counting 3.OA.1 (3 minutes)
- Tell Time on the Clock 3.MD.1 (3 minutes)
- Minute Counting 3.MD.1 (6 minutes)

Group Counting (3 minutes)

Note: Group counting reviews interpreting multiplication as repeated addition. Counting by sevens, eights, and nines in this activity anticipates multiplication using those units in Module 3.

Direct students to count forward and backward, occasionally changing the direction of the count using the following suggested sequence:

- Sevens to 49, emphasizing the 35 to 42 transition
- Eights to 56, emphasizing the 48 to 56 transition
- Nines to 63, emphasizing the 54 to 63 transition

Tell Time on the Clock (3 minutes)

Materials: (T) Analog clock for demonstration  (S) Personal white boards

Note: This activity provides additional practice with the skill of telling time to the nearest minute, taught in Lesson 3.

T: (Show an analog demonstration clock.) Start at 12 and count by 5 minutes on the clock.
(Move finger from 12 to 1, 2, 3, 4, etc., as students count.)
S: 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60.
T: I’ll show a time on the clock. Write the time on your board. (Show 11:23.)
S: (Write 11:23.)
T: (Show 9:17.)
S: (Write 9:17.)

Repeat process, varying the hour and minute so that students read and write a variety of times to the nearest minute.

**Minute Counting (6 minutes)**

Note: This activity reviews the Grade 2 standard of telling and writing time to the nearest 5 minutes. Students also practice group counting strategies for multiplication in the context of time.

Use the process outlined for this activity in G3–M2–Lesson 1. Direct students to count by 5 minutes to 1 hour, forward and backward, naming the quarter hour and half hour intervals as such. Repeat the process:

- 6 minutes to 1 hour, naming the half hour and 1 hour intervals as such
- 3 minutes to 30 minutes, naming the quarter hour and half hour intervals as such
- 9 minutes to quarter ‘til 1 hour
- 10 minutes, using the following sequence: 10 minutes, 20 minutes, 1 half hour, 40 minutes, 50 minutes, 1 hour

**Application Problem (5 minutes)**

Display a clock and number line as shown.

Patrick and Lilly start their chores at 5:00 p.m. The clock and the number line show the times that Patrick and Lilly finish their chores. Who finishes first? Explain how you know. Solve the problem without drawing a number line. You might want to visualize or use your clock template, draw a tape diagram, use words, number sentences, etc.

Note: This problem reviews Lesson 3, telling time to the nearest minute. This problem is used in the first example of the Concept Development to solve word problems involving minute intervals.
Lesson 4

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Lesson 4

Solve word problems involving time intervals within 1 hour by counting backward and forward using the number line and clock.

Date: 7/4/13

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NOTE

ON MULTIPLE MEANS FOR ACTION AND EXPRESSION:

If appropriate for your class, discuss strategies for solving different problem types (start unknown, change unknown, result unknown). Although problem types can be solved using a range of strategies, some methods are more efficient than others depending on the unknown.

Concept Development (33 minutes)

Materials: (T) Demonstration analog clock (S) Personal white boards, Number Line/Clock Template (shown right)

Problem 1: Count forward and backward using a number line to solve word problems involving time intervals within 1 hour.

T: Look back at your work on today’s Application Problem. We know that Lilly finished after Patrick. Let’s use a number line to figure out how many more minutes than Patrick Lilly took to finish. Slip the Number Line Template in your personal boards.

T: Label the first tick mark 0 and the last tick mark 60. Label the hours and 5-minute intervals.

T: Plot the times 5:31 p.m. and 5:43 p.m.

T: We could count by ones from 5:31 to 5:43, but that would take a long time! Discuss with a partner a more efficient way to find the difference between Patrick and Lilly’s times.

S: (Discuss.)

T: Work with a partner to find the difference between Patrick and Lilly’s times.

T: How many more minutes than Patrick did it take Lilly to finish her chores?

S: 12 minutes more.

T: What strategy did you use to solve this problem?

S: (Share possible strategies, listed below.)

- Count by ones to 5:35, by fives to 5:40, by ones to 5:43.
- Subtract 31 minutes from 43 minutes.
- Count backwards from 5:43 to 5:31.
- Know 9 minutes gets to 5:40 and 3 more minutes gets to 5:43.
- Add a ten and 2 ones.
Repeat the process with other time interval word problems, varying the unknown as suggested below.

- **Result unknown**: Start time and minutes elapsed known, end time unknown. (We started math at 10:15 a.m. We worked for 23 minutes. What time was it when we ended?)

- **Change unknown**: Start time and end time known, minutes elapsed unknown. (Leslie starts reading at 11:24 a.m. She finishes reading at 11:57 a.m. How many minutes does she read?)

- **Start unknown**: End time and minutes elapsed known, start time unknown. (Joe finishes his homework at 5:48 p.m. He works for 32 minutes. What time does he start his homework?)

**Problem 2**: Count forward and backward using a clock to solve word problems involving time intervals within 1 hour.

T: It took me 42 minutes to cook dinner last night. I finished cooking at 5:56 p.m. What time did I start?

T: Let’s use a clock to solve this problem. Use the Clock Template.

T: Work with your partner to draw the hands on your clock to show 5:56 p.m.

T: Talk with your partner, will you count backward or forward on the clock to solve this problem?

T: (After discussion.) Use an efficient strategy to count back 42 minutes. Write the start time on your personal white board and as you wait for others, record your strategy.

Circulate as students work and analyze their strategies so that you can select those you would like to have shared with the whole class. Also consider the order in which strategies will be shared.

T: What time did I start making dinner?

S: 5:14 p.m.

T: I would like to ask Nina and Hakop to share their work, in that order.

Repeat the process with other time interval word problems, varying the unknown as suggested below.

- **Result unknown**: Start time and minutes elapsed known, end time unknown. (Henry starts riding his bike at 3:12 p.m. He rides for 36 minutes. What time does he stop riding his bike?)

- **Change unknown**: Start time and end time known, minutes elapsed unknown. (I start exercising at 7:12 a.m. I finish exercising at 7:53 a.m. How many minutes do I exercise?).

- **Start unknown**: End time and minutes elapsed known, start time unknown. (Cassie works on her art project for 37 minutes. She finishes working at 1:48 p.m. What time does she start working?)
Lesson Objective: Solve word problems involving time intervals within 1 hour by counting backward and forward using the number line and clock.

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 are Problems 1 and 2 different? How did it affect the way you solved each problem?
- Did you count forward or backward to solve Problem 3? How did you decide which strategy to use?
- Discuss with a partner your strategy for solving Problem 6. What are other counting strategies that you could use with the clocks to get the same answer?
- Is 11:58 a.m. a reasonable answer for Problem 7? Why or why not?
- Explain to your partner how you solved Problem 8. How might you solve it without using a number line or a clock?
- How did we use counting as a strategy to problem solve today?
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.
Lesson 4: Solve word problems involving time intervals within 1 hour by counting backward and forward using the number line and clock.

Name ____________________________ Date ____________________

Directions: Use a number line to answer Problems 1 through 5.

1. Cole starts reading at 6:23 p.m. He stops at 6:49 p.m. How many minutes does Cole read?

Cole reads for __________ minutes.

2. Natalie finishes piano practice at 2:45 p.m. after practicing for 37 minutes. What time does Natalie’s practice start?

Natalie’s practice starts at __________ p.m.

3. Genevieve works on her scrapbook from 11:27 a.m. to 11:58 a.m. How many minutes does she work on her scrapbook?

Genevieve works on her scrapbook for __________ minutes.

4. Nate finishes his homework at 4:47 p.m. after working on it for 38 minutes. What time does Nate start his homework?

Nate starts his homework at __________ p.m.

5. Andrea goes fishing at 9:03 a.m. She fishes for 49 minutes. What time is Andrea done fishing?

Andrea is done fishing at __________ a.m.
6. Dion walks to school. The clocks below show when he leaves his house and when he arrives at school. How many minutes does it take Dion to walk to school?

Dion leaves his house:

```
12 11 10 9 8 7 6 5 4 3 2 1
```

Dion arrives at school:

```
12 11 10 9 8 7 6 5 4 3 2 1
```

7. Sydney cleans her room for 45 minutes. She starts at 11:13 a.m. What time does Sydney finish cleaning her room?

8. The third grade chorus performs a musical for the school. The musical lasts 42 minutes. It ends at 1:59 p.m. What time does the musical start?
Independent reading time starts at 1:34 p.m. It ends at 1:56 p.m.

Draw the start time on the clock below.  

Draw the end time on the clock below.

How many minutes does independent reading time last?
Lesson 4: Solve word problems involving time intervals within 1 hour by counting backward and forward using the number line and clock.

Record your homework start time on the clock in Problem 6.

Directions: Use a number line to answer Problems 1 through 4.

1. Joy’s mom begins walking at 4:12 p.m. She stops at 4:43 p.m. How many minutes does she walk?

Joy’s mom walks for __________ minutes.

2. Cassie finishes softball practice at 3:52 p.m. after practicing for 30 minutes. What time does Cassie’s practice start?

Cassie’s practice starts at ____________.

3. Jordie builds a model from 9:14 a.m. to 9:47 a.m. How many minutes does Jordie spend building his model?

Jordie builds for __________ minutes.

4. Cara finishes reading at 2:57 p.m. She reads for a total of 46 minutes. What time did Cara start reading?

Cara starts reading at __________ p.m.
5. Jenna and her mom take the bus to the mall. The clocks below show when they leave their house and when they arrive at the mall. How many minutes does it take them to get to the mall?

Time when they leave home: [Clock Image]

Time when they arrive at the mall: [Clock Image]

6. Record your homework start time: [Clock Image]

Record the time you finish Problems 1–5: [Clock Image]

How many minutes did you work on Problems 1–5?
Lesson 4: Solve word problems involving time intervals within 1 hour by counting backward and forward using the number line and clock.

Date: 7/4/13
Lesson 4: Solve word problems involving time intervals within 1 hour by counting backward and forward using the number line and clock.

Date: 7/4/13
Lesson 5

Objective: Solve word problems involving time intervals within 1 hour by adding and subtracting on the number line.

Suggested Lesson Structure

<table>
<thead>
<tr>
<th>Fluency Practice</th>
<th>12 minutes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application Problem</td>
<td>5 minutes</td>
</tr>
<tr>
<td>Concept Development</td>
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<tr>
<td>Student Debrief</td>
<td>10 minutes</td>
</tr>
<tr>
<td><strong>Total Time</strong></td>
<td><strong>60 minutes</strong></td>
</tr>
</tbody>
</table>

Fluency Practice (12 minutes)

- Group Counting 3.OA.1 (3 minutes)
- Tell Time on the Clock 3.MD.1 (3 minutes)
- Minute Counting 3.MD.1 (6 minutes)

Group Counting (3 minutes)

Note: Group counting reviews interpreting multiplication as repeated addition. Counting by sevens, eights, and nines in this activity anticipates multiplication using those units in Module 3.

Direct students to count forward and backward, occasionally changing the direction of the count using the following suggested sequence:

- Sevens to 56, emphasizing the transition of 49 to 56
- Eights to 64, emphasizing the transition of 56 to 64
- Nines to 72, emphasizing the transition of 63 to 72

Tell Time on the Clock (3 minutes)

Materials: (T) Analog clock for demonstration  (S) Personal white boards

Note: This activity provides additional practice with the newly learned skill of telling time to the nearest minute.

T: (Show an analog demonstration clock.) Start at 12 and count by 5 minutes on the clock. (Move finger from 12 to 1, 2, 3, 4, etc., as students count.)

S: 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60.

T: I’ll show a time on the clock. Write the time on your board. (Show 5:07.)
Lesson 5: Solve word problems involving time intervals within 1 hour by adding and subtracting on the number line.

S: (Write 5:07.)
T: (Show 12:54.)
S: (Write 12:54.)

Repeat process, varying the hour and minute so that students read and write a variety of times to the nearest minute.

**Minute Counting (6 minutes)**

Note: This activity reviews the Grade 2 standard of telling and writing time to the nearest 5 minutes. Students practice group counting strategies for multiplication in the context of time.

Use the process outlined in G3–M2–Lesson 1. Direct students to count by 5 minutes to 1 hour, forward and backward, naming the quarter hour and half hour intervals as such. Repeat the process for the following suggested sequences:

- 3 minutes to 30 minutes, naming the quarter hour and half hour intervals as such
- 6 minutes to 1 hour, naming the half hour and 1 hour intervals as such
- 9 minutes to 45 minutes, naming the quarter hours and half hour intervals as such (45 minutes is named *quarter 'til 1 hour* )
- 10 minutes, using the following sequence: 10 minutes, 20 minutes, 1 half hour, 40 minutes, 50 minutes, 1 hour

**Application Problem (5 minutes)**

Carlos gets to class at 9:08 a.m. He has to write down homework assignments and complete morning work before math begins at 9:30 a.m. How many minutes does Carlos have to complete his tasks before math begins?

Note: This problem reviews Lesson 4 and provides context for the problems in the Concept Development.

**MP.5**

Encourage students to discuss how they might solve using mental math strategies (e.g., count 9:18, 9:28 + 2 minutes, 2 + 20, 30 – 8).
Concept Development (33 minutes)

Materials: (S) Personal white boards, Side B: Number Line/Clock Template (shown right)

Part 1: Count forward and backward to add and subtract on the number line.

T: Use your number line template to label the points when Carlos arrives and when math starts.
S: (Label.)
T: Writing down homework assignments is the first thing Carlos does when he gets to class. It takes 4 minutes. Work with your partner to plot the point that shows when Carlos finishes this first task.
T: At what time did you plot the point?
S: 9:12 a.m.
T: What does the interval between 9:12 and 9:30 represent?
S: The number of minutes it takes Carlos to finish his morning work.
T: How can we find the number of minutes it takes Carlos to complete morning work?
S: Count on the number line. → Count forward from 9:12 to 9:30.
T: What addition sentence represents this problem?
S: 12 minutes + ____ = 30 minutes.
T: With your partner, find the number of minutes it takes Carlos to complete morning work.
T: How many minutes did it take Carlos to finish morning work?
S: 18 minutes.
T: Talk with your partner. How could we have modeled that problem by counting backward?
S: We could have started at 9:30 and counted back until we got to 9:12.
T: What subtraction sentence represents this problem?
S: 30 minutes − 12 minutes = 18 minutes.

Repeat the process using the following suggestions:

- Lunch starts at 12:05 p.m. and finishes at 12:40 p.m. How long is lunch?
- Joyce spends 24 minutes finding everything she needs at the grocery store. It takes her 7 minutes to pay. How long does it take Joyce to find her groceries and pay?

Part 2: Solve word problems involving time intervals within 1 hour.

T: Gia, Carlos’s classmate, gets to class at 9:11. It takes her 19 minutes to write homework assignments and complete morning work. How can we figure out if Gia will be ready to start math at 9:30?
S: We have to find out what time Gia finishes.
T: What do we know?
S: We know what time Gia starts and how long it takes her to complete her tasks.
Lesson 5: Solve word problems involving time intervals within 1 hour by adding and subtracting on the number line.

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T: What is unknown?
S: The time that Gia finishes.
T: How can we find what time Gia finishes morning work?
S: We can start at 9:11 and add 19 minutes. → We can add 11 minutes and 19 minutes to find out how many minutes after 9:00 she finishes.

T: (Draw the model below.) Talk with your partner about why this number line shows 11 minutes + 19 minutes. (Students discuss.)

T: When we add our 2 parts, 11 minutes + 19 minutes, what is our whole?
S: 30 minutes!
T: Does Gia finish on time?
S: Yes, just barely!
T: Think back to the Application Problem where Carlos gets to class at 9:08 a.m. Talk with your partner: What does 8 minutes represent in that problem?
S: 8 minutes is how long it takes Carlos to get to school.
T: We know the whole, 30 minutes, and 1 part. What does the unknown part represent?
S: The amount of time he takes to write homework and complete morning work.
T: Work with your partner to draw a number line and label the known and unknown intervals.
S: (Draw. One possible number line shown at right.)
T: What is 30 minutes – 8 minutes?
S: 22 minutes!

Repeat the process using the following suggestions:

- Joey gets home at 3:25 p.m. It takes him 7 minutes to unpack and 18 minutes to have a snack before starting his homework. What is the earliest time Joey can start his homework?
- Shane’s family wants to start eating dinner at 5:45 p.m. It takes him 15 minutes to set the table and 7 minutes to help put the food out. If Shane starts setting the table at 5:25 p.m., will his chores be finished by 5:45 p.m.?
- Tim gets on the bus at 8:32 a.m. and gets to school at 8:55 a.m. How long is Tim’s bus ride?

NOTE ON MULTIPLE MEANS OF ENGAGEMENT:
Relate addition on the number line with part–whole thinking. Use this connection with prior knowledge to encourage students to move from counting forward and backward toward more efficient number line representations like those modeled. Allow less confident students to verify these strategies by counting forward and backward.

NOTE ON MULTIPLE MEANS OF ENGAGEMENT:
Students who need an additional challenge can write their own word problems using real life experiences. Encourage them to precisely time themselves during an activity and use the information to write a word problem.
Joanne takes the same bus as Tim, but her bus ride is 25 minutes. What time does Joanne get on the bus?

Davis has 3 problems for math homework. He starts at 4:08 p.m. The first problem takes him 5 minutes, and the second takes him 6 minutes. If Davis finishes at 4:23 p.m., how long does it take him to solve the last problem?

**Problem Set (10 minutes)**

Students should do their personal best to complete the Problem Set within the allotted 10 minutes. Depending on your class, 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 solve these problems using the RDW approach used for Application Problems.

**Student Debrief (10 minutes)**

**Lesson Objective:** Solve word problems involving time intervals within 1 hour by adding and subtracting on a number line.

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.

- Describe the process of drawing the number line for Problem 2. Explain how you labeled it. Call on students who used different ways of thinking about and labeling parts and wholes to share.
- How did your answer to Problem 4(a) help you solve Problem 4(b)?
• In Problem 5, you had to find a start time. How is your approach to finding a start time different from your approach to finding an end time?
• Besides a number line, what other models could you use to solve Problems 2, 4, and 5?

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.
Lesson 5 Problem Set

Name ____________________________ Date ________________________

1. Cole read his book for 25 minutes yesterday and for 28 minutes today. How many minutes did Cole read altogether? Model the problem on the number line and write an equation to solve.

\[ \text{Cole read for } \_ \_ \_ \_ \_ \_ \_ \_ \text{ minutes.} \]

2. Tessa spends 34 minutes washing her dog. It takes her 12 minutes to shampoo and rinse, and the rest of the time to get the dog in the bathtub! How many minutes does Tessa spend getting her dog in the bathtub? Draw a number line to model the problem and write an equation to solve.

3. Tessa walks her dog for 47 minutes. Jeremiah walks his dog for 30 minutes. How many more minutes does Tessa walk her dog than Jeremiah?

4. a. It takes Austin 4 minutes to take out the garbage, 12 minutes to wash the dishes, and 13 minutes to mop the kitchen floor. How long does it take Austin to do his chores?
4. b. Austin’s bus arrives at 7:55 a.m. If he starts his chores at 7:30 a.m., will he be done in time to meet his bus? Explain your reasoning.

5. Gilberto’s cat sleeps in the sun for 23 minutes. It wakes up at the time shown on the clock below. What time did the cat go to sleep?
Michael spends 19 minutes on his math homework and 17 minutes on his science homework. How many minutes does Michael spend doing homework?

Model the problem on the number line and write an equation to solve.

Michael spends _________ minutes on his homework.
1. Abby spent 22 minutes doing her science project yesterday and 34 minutes doing it today. How many minutes does Abby spend working on her science project altogether? Model the problem on the number line and write an equation to solve.

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0 10 20 30 40 50 60
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Abby spends ________ minutes.

2. Susanna spends a total of 47 minutes working on her project. How many more minutes than Susanna does Abby spend working? Draw a number line to model the problem and write an equation to solve.

3. Peter practices violin for a total of 55 minutes over the weekend. He practices 25 minutes on Saturday. How many minutes does he practice on Sunday?
4. a. Marcus gardens. He pulls weeds for 18 minutes, waters for 13 minutes, and plants for 16 minutes. How many total minutes does he spend gardening?

4. b. Marcus wants to watch a movie that starts at 2:55 p.m. It takes 10 minutes to drive to the theater. If Marcus starts the yard work at 2:00 p.m., can he make it on time for the movie? Explain your reasoning.

5. Arelli takes a short nap after school. As she falls asleep the clock reads 3:03 p.m. She wakes up at the time shown below. How long is Arelli’s nap?
Lesson 5: Solve word problems involving time intervals within 1 hour by adding and subtracting on the number line.

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