

## Just in Time Quick Check

### Standard of Learning 4.MG.2

#### **Strand:** Measurement and Geometry

#### **Standard of Learning 4.MG.2**

**The student will solve single-step and multistep contextual problems involving elapsed time (limited to hours and minutes within a 12-hour period).**

*Students will demonstrate the following Knowledge and Skills:*

- a) Solve single-step and multistep contextual problems involving elapsed time in hours and minutes, within a 12-hour period (within a.m., within p.m., and across a.m. and p.m.) when given:
  - i) the starting time and the ending time, determine the amount of time that has elapsed in hours and minutes;
  - ii) the starting time and amount of elapsed time in hours and minutes, determine the ending time; or
  - iii) the ending time and the amount of elapsed time in hours and minutes, determine the starting time.

#### Just in Time Quick Check

#### Just in Time Quick Check Teacher Notes

**Supporting and Prerequisite SOL:** 4.CE.1, 3.MG.3

### Just in Time Quick Check 4.MG.2

1. Heidi woke up at 8:12 a.m. She ate breakfast and then watched television for a total of 2 hours and 30 minutes. What time was it when Heidi finished watching television? Use a diagram, model, words, and/or numbers to show how you know.

2. Jaheim arrived at the park at 4:35 p.m. and left the park at 6:15 p.m. How long was Jaheim at the park? Use the number line or create another model to find the answer and show your thinking.



3. Jenna played in a softball tournament that ended in the evening at the time shown on the clock below. The tournament lasted for 4 hours, 17 minutes. What time did the tournament begin? Use the number line or another model to show your thinking.



4. Determine the elapsed time between the times shown on the two clocks.



Starting time

|                |
|----------------|
| ___ : ___ a.m. |
|----------------|



Ending time

|                |
|----------------|
| ___ : ___ p.m. |
|----------------|

Elapsed time \_\_\_\_\_

5. Janelle went to bed at 9:12 p.m. She had been awake for 11 hours and 32 minutes. What was the time when Janelle got up that morning?

## 4.MG.2 Just in Time Quick Check Teacher Notes

### Common Errors/Misconceptions and their Possible Indications

1. Heidi woke up at 8:12 a.m. She ate breakfast and then watched television for a total of 2 hours and 30 minutes. What time was it when Heidi finished watching television? Use a diagram, model, words, and/or numbers to show how you know.

*Some students may respond with 9:42 a.m., which may indicate students counted on two hours but included 8:12 a.m. as the first hour in their count. These students may benefit from using geared analog clocks to model the context and determine the ending time. Teachers may also wish to encourage students to use a blank number line to count the hops between hours, as this model may help students visualize the passage of time.*

2. Jaheim arrived at the park at 4:35 p.m. and left the park at 6:15 p.m. How long was Jaheim at the park? Use the number line or create another model to find the answer and show your thinking.



*Some students may respond with 2 hours 20 minutes, which may indicate they are subtracting hours ( $6 - 4$ ) and then subtracting minutes ( $35 - 15$ ). These students may not understand that breaking apart the hours and minutes and rearranging the order of the minutes to subtract 15 from 35 is not a valid action. Students may benefit from more experience using manipulative clocks with gears to model the passing of time and determine the amount of time that has passed. Modeling the passage of time on a number line may also be helpful.*

*Some students may not understand or be able to apply the relationship between minutes and hours. Teachers may wish to provide scaffolded practice where students first practice elapsed time with hours and then minutes before transitioning to both hours and minutes. Using real life examples, such as determining elapsed time between activities throughout the school day, may make this skill more relevant to students.*

3. Jenna played in a softball tournament that ended in the evening at the time shown on the clock below. The tournament lasted for 4 hours, 17 minutes. What time did the tournament begin? Use the number line or another model to show your thinking.



*Students may have difficulty with this problem because they must read the analog clock and then work backwards to determine the missing start time. Some students may not know whether the answer should be reported as a.m. or p.m. Classroom discussions during which peers share strategies and models may be helpful. Teachers may wish to encourage students to create a chart where they fill in the two parts of the problem that are known and place a question mark in the unknown part (see below). Additionally, using interactive analog clocks with gears, as well as number lines, will assist students in modeling the passage of time.*

| Start Time | Elapsed Time        | End Time  |
|------------|---------------------|-----------|
| ?          | 8 hours, 17 minutes | 7:41 p.m. |

4. Determine the elapsed time between the times shown on the two clocks.



Starting time

\_\_\_ : \_\_\_ a.m.



Ending time

\_\_\_ : \_\_\_ p.m.

Elapsed time \_\_\_\_\_

*Some students may have difficulty with this problem due to a lack of understanding of the 12-hour cycle as it crosses from a.m. to p.m. Demonstrating how hours 13-24 relate to hours 1-12 in a 24-hour period may assist students in the conceptualization of the 12-hour cycles within the 24-hour period. Some students may add or subtract the beginning and ending times to determine*

*elapsed time. Experiences that include using an interactive analog clock with gears, open number line, or t-chart in determining elapsed time and exposure to peers' problem-solving strategies may be beneficial to students.*

*If students struggle with determining the elapsed time, first check to see if they determined the starting and ending times accurately. Some students may have difficulty with telling time on analog clocks or may confuse the minute and hour hands. Some students may have difficulty counting the clock numbers by fives to determine the associated minute time (e.g., when the minute hand is at 4, this represents 20 minutes after the hour). Teachers may wish to provide a labeled analog clock as students develop this skill, labeling the short hand as "hours" and the long hand as "minutes," as well as labeling the hour numbers on the clock with the multiples of five that coincide with the minute time.*

5. Janelle went to bed at 9:12 p.m. She had been awake for 11 hours and 32 minutes. What was the time when Janelle got up that morning?

*Some students may have difficulty with this problem because they must work backward from the ending time to determine the unknown beginning time. Students may benefit from more experiences with contextual problems when the beginning time is unknown. Some students may not understand that the answer should be reported as a.m. These students may benefit from more opportunities to solve contextual problems involving elapsed time that include crossing from a.m. to p.m. and vice versa. Teachers may want to encourage students to create a chart where they fill in the two parts of the problem that are known (in this problem, the ending time and elapsed time are known) and place a question mark in the unknown part (in this problem the starting time is unknown). See the example below. Using organizers or models (e.g., open number line, t-chart, interactive analog clock) may be helpful when solving practical problems involving elapsed time.*

| <b>Start Time</b> | <b>Elapsed Time</b>  | <b>End Time</b> |
|-------------------|----------------------|-----------------|
| ?                 | 11 hours, 32 minutes | 9:12 p.m.       |