

Illustrative Mathematics

5.MD Minutes and Days

Alignments to Content Standards

- [Alignment: 5.MD.A.1](#)
- [Alignment: 5.NBT.B.6](#)

Tags

Tags: AMC

What time was it 2011 minutes after the beginning of January 1, 2011?

Commentary

This task requires division of multi-digit numbers in the context of changing units and so illustrates 5.NBT.6 and 5.MD.1. In addition, the conversion problem requires two steps since 2011 minutes needs to be converted first to hours and minutes and then to days, hours, and minutes. In the solution, the division problem $2011 \div 60$ is handled in a way that aligns both with the usual division algorithm and with the scaffold method.

This task was adapted from problem #3 on the 2011 American Mathematics Competition 8 (AMC) Test. The responses to the multiple choice answers for the problem had the following distribution:

Choice	Answer	Percentage of Answers
(A)	January 1 at 9:31pm	20.08
(B)	January 1 at 11:51pm	5.58
(C)	January 2 at 3:11am	4.24
(D)*	January 2 at 9:31am	65.24
(E)	January 2 at 6:01pm	3.64
Omit	--	1.18

Of the 153,485 students 72,648 or 47% were in 8th grade, 50,433 or 33% were in 7th grade, and the remainder were less than 7th grade.

Solutions

Solution: 1

January 1, 2011 begins at 12:00 AM. To find the time 2011 minutes later will require changing units since time is told in hours and minutes. There are 60 minutes in an hour so to see how many hours there are in 2011 minutes we can perform the division problem $2011 \div 60$. Since $30 \times 60 = 1800$, we can write

$$2011 = 30 \times 60 + 211.$$

Next, 60 goes into 211 three times, with a remainder of 31 so we get

$$2011 = 30 \times 60 + 3 \times 60 + 31.$$

Using the distributive property this last expression is equivalent to

$$2011 = (30 + 3) \times 60 + 31.$$

So 2011 minutes is the same as 33 hours and 31 minutes. Now 33 hours is one day and an additional 9 hours so this means that 2011 minutes is one day, nine hours, and thirty-one minutes. So 2011 minutes after the beginning of 2011 it is January 2 and it is 9:31 AM.



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