Assessment : End-of-Unit Assessment

Problem 1

Students identify how to represent a number using words or expanded form. Students who select B, C, or D either have not looked carefully at the given number or need extra practice with place value. Students who select more than one of B, C, or D need extra review with the meaning of place value. Note that responses B and C go together so a student who selects one should logically select the other as well.

Statement

Select **all** representations of the number 89,500.

A. Eighty-nine thousand five hundred

B. Eight thousand nine hundred fifty

C. $8{,}000 + 900 + 50$

D. $80{,}000 + 5{,}000 + 90$

E. $80{,}000 + 9{,}000 + 500$

Solution

["A", "E"]

Aligned Standards

4.NBT.A.2

Problem 2

Students compare numbers within 1,000,000. Students who answer the last problem incorrectly may have been careless as the digits are the same in the leftmost three places. If students answer more than one of these inequalities incorrectly they need more work with place value and using $<$ and $>$ to compare numbers.

Statement

Write $<$ or $>$ in each blank to make the statement true.

1. $587{,}207 \_\_\_\_\_ 591{,}025$
2. $127{,}937 \_\_\_\_\_ 97{,}941$
3. $386{,}981 \_\_\_\_\_ 386{,}898$

Solution

1. $<$
2. $>$

3. >

Aligned Standards

4.NBT.A.2

Problem 3

Students multiply a whole number by 10 in context and explain why the digits are the same but they are shifted to the left by one place and there is a 0 at the end. Students can think about this in many ways, for example

- drawing diagrams of base-ten blocks
- thinking about the meaning of each place value in a whole number
- thinking about 225 in expanded form and multiplying each part by 10

Statement

The distance between New York City and Boston is 225 miles. The distance between New York City and Salt Lake City is 10 times as far. How many miles is it between New York City and Salt Lake City? Explain or show your reasoning.

Solution

It is 2,250 miles from New York City to Salt Lake City. The first 3 digits in 2,250 are the same as those in 225 but their values are all multiplied by 10 because they are one place further to the left.

Aligned Standards

4.NBT.A.1

Problem 4

Students find expressions equivalent to a given fraction with a denominator of 100. Some of the expressions are given as decimals so students demonstrate understanding how to express a fraction as a decimal or a decimal as a fraction. Students who select B or F or fail to select D need further work understanding the fraction equivalent of a decimal number. Students who select C or fail to select E may need further work with fractions having denominators 10 and 100.

Statement

Select **all** expressions with the same value as $\frac{30}{100}$.

A. $\frac{3}{10}$

B. 0.03

C. $\frac{2}{10} + \frac{3}{100} + \frac{7}{10}$

D. 0.30

E. $\frac{2}{10} + \frac{10}{100}$

F. 0.33

Solution

["A", "D", "E"]

Aligned Standards

4.NF.C.5, 4.NF.C.6

Problem 5

Students find a sum and a difference without a context. The problems are arranged in a way that encourages the use of the standard algorithm. Students can use any strategy that makes sense to them, including using the standard algorithms or their understanding of place value.

Statement

Find the sum or difference.

1.
$$\begin{array}{r} 324,567 \\ +\ \ 34,762 \\ \hline \end{array}$$

2.
$$\begin{array}{r} 827,419 \\ -\ \ 80,125 \\ \hline \end{array}$$

Solution

1. 359,329

$$\begin{array}{r} {\scriptstyle 1\ \ 1\ \ \ \ \ \ } \\ 324,567 \\ +\ \ 34,762 \\ \hline 359,329 \end{array}$$

2. 747,294

$$\begin{array}{r} {\scriptstyle 7\ 12\ \ \ 3\ 11\ \ \ \ \ \ } \\ \cancel{8}\ \cancel{2}\ 7,\ \cancel{4}\ \cancel{1}\ 9 \\ -\ \ 80,125 \\ \hline 747,294 \end{array}$$

Aligned Standards

4.NBT.B.4

Problem 6

Students find a decimal between two decimal numbers using time as a context. Since the two times given are in tenths of a second, 6.8 and 6.9, students need to realize that they can only find a decimal between these two numbers if they use hundredths. They may draw a number line showing hundredths between 6.8

and 6.9 or they may reason that 6.8 and 6.9 can be written as 6.80 and 6.90.

Statement

Clare, Han, and Andre each ran 40 yards. It took Clare 6.8 seconds and Han 6.9 seconds. Andre finished in less time than Han but more time than Clare. What could Andre's time be? Explain or show your reasoning.

Solution

Sample response: Andre's time could be 6.83 seconds. Clare's time is 6.80 seconds and Han's time is 6.90 so I need some number of hundredths between 80 and 90. Since 83 is between 80 and 90, 6.83 is between 6.80 and 6.90.

Aligned Standards

4.NF.C.7

Problem 7

Students round a number to different place values without the support of a number line. Students may draw a number line to help visualize the numbers but they will need to label those number lines carefully in order for them to be helpful. Students may select A, D and E, and not select B, if they simply drop the smaller place values from the number which would mean that they always round down. Other mistakes may occur because they are not reading the 6-digit number carefully.

Statement

Select **all** true statements.

A. 287,164 rounded to the nearest hundred-thousand is 200,000.

B. 287,164 rounded to the nearest ten-thousand is 290,000.

C. 287,164 rounded to the nearest thousand is 287,000.

D. 287,164 rounded to the nearest hundred is 287,100.

E. 287,164 rounded to the nearest ten is 287,170.

Solution

["B", "C"]

Aligned Standards

4.NBT.A.3

Problem 8

Students compare and subtract whole numbers within one million. They can use any method to perform the subtraction. To find the difference between the two school districts, the standard algorithm is a likely choice. To find how many more students are needed to reach one million, adding on is a useful strategy and the way the problem is worded encourages this strategy.

data from here:

https://en.wikipedia.org/wiki/List_of_the_largest_school_districts_in_the_United_States_by_enrollment

Statement

A school district in Los Angeles reported 633,621 students in 2016. A school district in New York City reported 984,462 students in the same year.

1. Which school district had more students? Explain your reasoning.
2. How many more students? Explain or show your reasoning.
3. How many more students does the school district in New York need to have 1,000,000 students? Explain or show your reasoning.

Solution

1. The New York City district has more because the Los Angeles district has less than 700,000 students and the New York district has more than 900,000 students.
2. 350,841. Sample response:

$$\begin{array}{r} {\scriptstyle 3\ 14} \\ 9\,8\,\cancel{4},\,\cancel{4}\,6\,2 \\ -\ 6\,3\,3,\,6\,2\,1 \\ \hline 3\,5\,0,\,8\,4\,1 \end{array}$$

3. 15,538. Sample response: I need to add 15,537 to get 999,999 and then it's 1 more to 1,000,000.

Aligned Standards

4.NBT.B.4