Assessment : End-of-Unit Assessment

Problem 1

Students solve a multiplicative comparison problem. They may write an equation or draw a diagram to help support their thinking. If students subtract 3 from 93 or multiply 93 by 3 then they need more practice with this type of problem in order to identify the correct operation. These students may benefit by first making a drawing or writing an equation to represent the problem.

Statement

There are 93 students in the cafeteria. There are 3 times as many students in the cafeteria as there are students on the playground.

1. Write a multiplication equation that represents the situation.
2. How many students are on the playground? Explain or show your reasoning.

Solution

1. Sample response: $93 = 3 \times ?$ or $93 = ? \times 3$ or equivalent.
2. 31. Sample response: $3 \times 30 = 90$ and $3 \times 1 = 3$ so $3 \times 31 = 93$.

Aligned Standards

4.OA.A.1, 4.OA.A.2

Problem 2

Students choose correct conversion statements for metric and standard units. Students who select A or D have the conversion factor backward. The conversions are each one-step. Students who do not perform well on this item will likely struggle on other items that involve more complex conversions.

Statement

Select **all** true statements.

A. One meter is 1,000 kilometers.

B. One foot is 12 inches.

C. One meter is 100 centimeters.

D. One centimeter is 100 meters.

E. One kilometer is 1,000 meters.

Solution

["B", "C", "E"]

Aligned Standards

4.MD.A.1

Problem 3

Students choose a correct conversion statement between inches and feet. Each distractor uses the correct conversion factor but the wrong operation, namely subtraction for 60, addition for 84, and multiplication for 864. None of the distractors is reasonable so students who miss this item need more work on visualizing length units.

Statement

The length of the table in inches is 72. What is the length of the table in feet?

A. 6

B. 60

C. 82

D. 864

Solution

A

Aligned Standards

4.MD.A.1

Problem 4

Students reason about the perimeter and side lengths of different rectangles. Students may choose E if they forget that a rectangle has two sides of each length and they may choose C if they are thinking of a particular rectangle such as a square. If students do not select A or D they have likely made a calculation error or do not understand what the perimeter of a rectangle or square is.

Statement

The perimeter of a rectangle is 40 cm. Select **all** the true statements.

A. If one side measures 10 cm, then it is a square.

B. The rectangle cannot have a side that measures 21 cm.

C. The rectangle cannot have a side that measures 15 cm.

D. If one side measures $6\frac{3}{8}$ cm, then another side measures $13\frac{5}{8}$ cm.

E. If one side measures 1 cm, then another side measures 39 cm.

Solution

["A", "B", "D"]

Aligned Standards

4.MD.A.3

Problem 5

Students complete a table converting pounds to ounces. Because they need to multiply by 16, the numbers being converted have been kept friendly so that students can use place value understanding to find the values efficiently. Students who forget the number of ounces in a pound can still show arithmetic fluency and an understanding of how conversions work with an incorrect conversion factor.

Statement

Complete the table showing the number of ounces for the measurements given in pounds.

pounds	ounces
1	
5	
10	
20	
50	

Solution

pounds	ounces
1	16
5	80
10	160
20	320
50	800

Aligned Standards

4.MD.A.1, 4.NBT.B.5

Problem 6

Students examine an incorrect unit conversion. Rather than multiplying by 100 to find the number of centimeters in 2,500 meters, Noah divided by 100. Students can grasp that Noah's reasoning is incorrect without understanding which mistake he made because 25 centimeters is a very small distance and a lake is very big.

Statement

A lake is 2,500 meters wide. Noah says that's 25 centimeters.

1. Explain why Noah's answer is not reasonable.
2. How many centimeters wide is the lake?

Solution

1. 25 centimeters is about the length of a ruler while a lake is much larger.
2. 250,000 cm, because there are 100 centimeters in each meter.

Aligned Standards

4.MD.A.1

Problem 7

Students compare two quantities given in different metric units, deciding which is larger and then calculating the difference. The numbers in the problem are friendly as students need to find 7×200 and then $3 \times 1{,}000 - 7 \times 200$. The focus of the problem is on understanding the need to convert kilograms to grams and understanding that the question is about how much the dogs eat in a week while the information given for Priya's dog is for a day.

Statement

Han's dog eats $3\frac{1}{2}$ kilograms of food a week. Priya's dog eats 400 grams of food each day.

1. Explain why $\frac{1}{2}$ kilogram is 500 grams.
2. Which dog eats more food each week? Explain or show your reasoning.
3. How much more food? Explain or show your reasoning.

Solution

1. There are 1,000 grams in a kilogram so half a kilogram is half of 1,000 or 500.
2. Han's dog eats more. Sample reasoning: 3 kilograms is 3,000 grams and 500 more is 3,500, which is what Han's dog eats. Priya's dog only eats 2,800 grams of food in a week or 7 days ($7 \times 400 = 2{,}800$).
3. 700 grams. $3{,}500 - 2{,}800 = 700$

Aligned Standards

4.MD.A.2