

Extended Problems: Real-World Application

Whole Number Operations Answer Key

Starter feedback for correct and incorrect answers is provided. Use or adapt the feedback in this Answer Key as you grade students' work. Answers will vary. Representative examples are shown here.

Problem 1 (3 points)

Model Answer

- (a) Kai's statement is not correct.
- (b) Sample answer: If Kai counts by 4s on a number line there are only 4 numbers in each "jump," so it takes more jumps (or multiples) to get to 36. If Taya counts by 6s on a number line, there is a group of 6 numbers in each "jump," so it does not take Kai fewer multiples to count to 36.

Sample answer: If Kai counts by multiples of 4 there is a skip of 4 between each number, so it takes Kai more skips counting by multiples of 4 (9 skips) to count to 36. If Taya skip-counts by multiples of 6 there is a skip of 6 between each multiple, so it takes fewer skips of 6 (6 skips) to count to 36.

Award points for specific answers as shown below (for a total of 0–3 points).

Points	Concept Addressed	Feedback for Student Answers
1	Correctly states that Kai is not correct.	List all the multiples of 4 from 4 to 36. List all the multiples of 6 from 6 to 36. Compare to find out which person used more multiples to count to 36.
2	Clearly explains why fewer multiples of 6 than multiples of 4 are used to count to 36.	Go back and review the Prime Numbers Less Than 100 lesson to review multiples.

Feedback for completely correct answer:

You used what you know about multiples to solve a problem and you clearly explained your thinking.

Problem 2 (3 points)

Model Answer

Sample answer: 60 towels and 42 towels can be arranged into equal stacks. They are numbers that can be divided into equal groups in a number of ways besides being divided by the number itself or 1. For example, 60 can be divided into 2 stacks of 30 towels and 5 stacks of 12 towels. The numbers 37 and 29 can't be divided into equal groups unless there is only 1 in each stack or the whole amount is in just 1 stack.

Sample answer: The numbers 60 and 42 are composite numbers. There are a number of ways to divide each number of towels into equal stacks because they have more factors than just 1 and the number itself. The numbers 29 and 37 are prime numbers so they can only be divided by 1 or the number itself into equal stacks.

Award points for specific answers as shown below (for a total of 0–3 points).

Points	Concept Addressed	Feedback for Student Answers
3	Correctly states which number of towels can be stacked in equal piles (1 point). Correctly explains why each number can or cannot be stacked in equal piles. (2 points)	Go back and review the Prime Numbers Less Than 100 lesson to review prime and composite numbers.

Feedback for completely correct answer:

You used your knowledge of prime and composite numbers to solve problems. You explained your thinking clearly.

Problem 3 (4 points)**Model Answer**

- (a) Possible answers: 19 cars with 26 people or 26 cars with 19 people (total: 494); 18 cars with 27 people or 27 cars with 18 people (total: 486); 17 cars with 29 people or 29 cars and 17 people (total: 493); 21 cars with 23 people or 23 cars with 21 people (total: 483); 22 cars with 22 people (total: 484)
- (b) Sample answer: I used friendly numbers to estimate that 20×25 is 500. That's just a bit too high, so I tried $20 \times 24 = 480$, which was too low. I knew that the factors had to be less than 30, so I multiplied $15 \times 29 = 435$, which was way too low. I guessed $19 \times 28 = 532$. That was too high. So I tried $18 \times 27 = 486$, which works. Then I kept guessing and checking to find the other set of factors. I kept track of all the factors so I knew what I had already tried.
- (c) See answers for Part (a).

Award points for specific answers as shown below (for a total of 0–4 points).

Points	Concept Addressed	Feedback for Student Answers
1	Correctly finds a possible number for the number of cars and the number of people in each car.	Use friendly numbers to guess and check to find two factors that equal a product greater than 480 and less than 500.
2	Clearly explains a correct strategy to solve the problem.	Recheck each step of your explanation to be sure it is clear and correct. Go back and review the Multiply by 2-Digit Numbers B lesson to review ways to multiply by two-digit numbers.
1	Correctly finds another possible solution to the problem.	Use friendly numbers to guess and check to find two factors that equal a product greater than 480 and less than 500.

Feedback for completely correct answer:

You used number sense and strategies to solve a problem that involves multiplying 2 two-digit numbers.

Problem 4 (3 points)**Model Answer**

- (a) $15 \times 12 = n$ and $180 \times 3 = m$
- (b) 540 people

Award points for specific answers as shown below (for a total of 0–3 points).

Points	Concept Addressed	Feedback for Student Answers
2	Correctly writes an equation with a letter for the unknown number to represent each part of the problem. (1 point for each correct equation)	Did you write an equation for each of the two parts of the problem? Did you use a letter for the unknown number in each equation?

Points	Concept Addressed	Feedback for Student Answers
1	Correctly solves the problem.	You could multiply 15 by 12 to find the total number of people in all the rafts. Then you would multiply that number by 3 because this ride runs 3 times each hour.

Feedback for completely correct answer:

You represented and solved a two-step problem involving multiplication.

Problem 5 (3 points)**Model Answer**

- (a) The water park has 128 giant inner tubes.
- (b) I multiplied $4 \times 16 = 64$ because there are 4 times as many water sprinklers as water slides. Then I multiplied $64 \times 2 = 128$ because there are 2 times as many giant inner tubes as water sprinklers.

Award points for specific answers as shown below (for a total of 0–3 points).

Points	Concept Addressed	Feedback for Student Answers
1	Correctly solves a two-step multiplication problem.	Go back and review the Multiply Multidigit by 1-Digit Numbers lesson to review the meaning of “2 times as many” and “4 times as many” in a problem.
2	Clearly explains how to solve the problem.	Go back and review the Multiply by 2-Digit Numbers A and B lessons to review ways to multiply 2 two-digit numbers.

Feedback for completely correct answer:

You solved a two-step problem involving “times as many.” You correctly multiplied a two-digit number by a one-digit number to solve a problem.

Problem 6 (4 points)**Model Answer**

- (a) Sample answer: There were 141 people who want to ride the Raging River Raft Ride. Only 6 people can ride in each raft. How many rafts are needed for all the people to ride if all the rafts contain the greatest number of people?
- (b) Sample answer: 24 rafts are needed.
- (c) Sample answer: Yes, the quotient has a remainder. I divided 141 by 6 and I got the quotient 23, remainder 3. Besides the 6 rafts, 1 more raft is needed for the extra 3 people. That means 24 rafts are needed in all.

Award points for specific answers as shown below (for a total of 0–4 points).

Points	Concept Addressed	Feedback for Student Answers
2	Correctly writes a division story problem that matches the expression.	Did you clearly write a story problem that asks for 141 to be divided equally into groups of 6?

Points	Concept Addressed	Feedback for Student Answers
1	Correctly finds the quotient for the division story problem.	Go back and review the Different Ways to Divide A and B lessons to review division with remainders.
1	Clearly explains how the remainder could be interpreted in the problem.	Go back and review the Different Ways to Divide A and B lessons to review division with remainders.

Feedback for completely correct answer:

You wrote a division story that matched an equation and solved the problem. You clearly explained how you interpreted the remainder when you solved the problem.