Cluster 5.3: Number and Operations

5.3B: Operations with Whole Numbers: Paying Rent

Focusing TEKS	Focusing Mathematical Processes
5.3B Number and operations. The student applies mathematical process standards to develop and use strategies and methods for positive rational number computations in order to solve problems with efficiency and accuracy. The student is expected to multiply with fluency a three-digit number by a two-digit number using the standard algorithm. **Supporting Standard** Additional TEKS: 5.3K Add and subtract rational numbers fluently. **Readiness Standard**	5.1A Apply mathematics to problems arising in everyday life, society, and the workplace. 5.1B Use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution. 5.1C Select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques including mental math, estimation, and number sense as appropriate, to solve problems.

Performance Task

Mikaela has lived in her apartment for 2 years and paid $841 per month in rent. Her best friend Paula has lived in her apartment for 1 year and paid $765 per month in rent. Altogether, how much did the two friends spend in rent in 1 year? Justify your reasoning.

Answer: *$19,272*

Cluster 5.3: Number and Operations

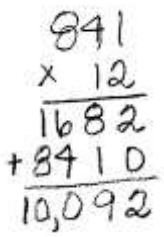
Mathematically Speaking...

In this task, students are being asked to focus on the processes used to multiply whole numbers, and in particular, to apply a standard algorithm for multiplication. In grade 3 mathematics, students began multiplication with whole numbers using models and pictures to support conceptual development. By grade 4, students combined strategies developed from these models and mathematical properties, to formulate standard algebraic and computational processes.

Some students may find the total monthly combined cost of rent for the two girls and multiply this sum by the 12 months. Students who do this have developed some conceptual understanding of how to apply the distributive property to solve problems. Students may also modify the standard algorithm and use partial product multiplication, which is embedded within the standard multiplication algorithm.

Possible Solution

One year of time is 12 months. Mikaela paid rent of $841 each month. One year of rent for her is the product of 12 and 841.



Even though the standard states "using the standard algorithm", Students may decompose the 12 and use the distributive property to multiply.

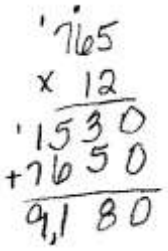
(10 × 841) + (2 × 841)

Mikaela spent $10,092 for rent in 12 months, or 1 year's time.

Reasonableness

Student understanding about multiplying by ten helps to check the reasonableness of the answer to this problem. Mikaela spent more than $8,410 on rent in one year because in ten months she spent $8,410, and there are 12 months in one year.

Paula paid rent of $765 each month. One year of rent for her is the product of 12 and 765.



Even though the standard states "using the standard algorithm", Students may decompose the 12 and use the distributive property to multiply.

(10 × 765) + (2 × 765)

Paula spent $9,180 on rent in 12 months, or 1 year's time.

Reasonableness

Student understanding about multiplying by ten helps to check the reasonableness of the answer to this problem. Paula spent more than $7,650 on rent in one year because in ten months she spent $7,650, and there are 12 months in one year.

To find the amount of rent spent altogether in 1 year, the amount Mikaela spent for rent in 1 year should be added to the amount Paula spent for rent in 1 year.

$10,092 + $9,180 = $19,272

In one year, the friends spent a combined amount of $19,272 on rent.

Look For...

- an understanding that there are 12 months in one year
- an understanding of place value when multiplying a three-digit number by a two-digit number
- an understanding of the processes of the standard multiplication algorithm
- student justification of choices of solution strategy

Cluster 5.3: Number and Operations

Differentiation: Simplified Task	Differentiation: Enriching Task
Mikaela has lived in her apartment for 1 year and paid $841 per month in rent. Her best friend Paula has also lived in her apartment for 1 year and paid $765 per month in rent. How much has each girl spent in rent so far? Justify your reasoning. ***Answer**: Mikaela spent $10,092 and Paula spent $9,180 in rent.*	Mikaela has lived in her apartment for 2 years and paid $841 per month in rent. Her best friend Paula has lived in her apartment for 1 year and paid $765 per month in rent. How much has each girl spent in rent during the time she has lived in her apartment? If the friends move into an apartment together, and the apartment rents for $998 per month, how much total money would they save in rent in one year's time? Justify your reasoning. ***Answer**: Mikaela has spent a total of $20,184. Paula has spent $9,180. If they live together, they would pay $11,976 in one year. Together they currently spend $19,272 living separately so they would save $7,296 in 1 year living together.*

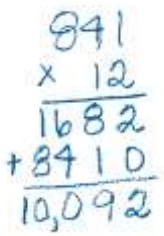
Cluster 5.3: Number and Operations

Scaffolded Task with Answers

Mikaela has lived in her apartment for 2 years and paid $841 per month in rent. Her best friend Paula has lived in her apartment for 1 year and paid $765 per month in rent.

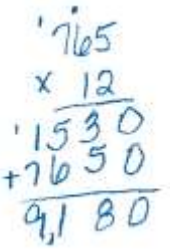
1. How many months are in one year of time?
   One year of time is 12 months.

2. How much did Mikaela spend in rent in 1 year?
   Mikaela paid rent of $841 each month. One year of rent for her is the product of 12 and 841.



   Mikaela spent $10,092 in 12 months, or 1 year's time.

3. How much did Paula spend in rent in 1 year?
   Paula ~~pays~~ paid rent of $765 each month. One year of rent for her is the product of 12 and 765.



   Paula spent $9,180 in 12 months, or 1 year's time.

4. How much did the two friends spend in rent altogether in 1 year?
   To find the amount of rent spent altogether in 1 year you would add the amounts.

   $10,092 + $9,180 = $19,272

   In one year, the friends spent a combined amount of $19,272 on rent.

Name _____ Date _____

Performance Task: 5.3B

Operations with Whole Numbers: Paying Rent

Mikaela has lived in her apartment for 2 years and paid $841 per month in rent. Her best friend Paula has lived in her apartment for 1 year and paid $765 per month in rent. Altogether, how much did the two friends spend in rent in 1 year? Justify your reasoning

Procedural	0	1	2
Conceptual	0	1	2
Communication	0	1	2

Total points:_____

Name _____ Date _____

Performance Task: 5.3B

Operations with Whole Numbers: Paying Rent

Mikaela has lived in her apartment for 1 year and paid $841 per month in rent. Her best friend Paula has also lived in her apartment for 1 year and paid $765 per month in rent. How much has each girl spent in rent so far? Justify your reasoning.

Procedural	0	1	2
Conceptual	0	1	2
Communication	0	1	2

Total points:_____

Name _____ Date _____

Performance Task: 5.3B
Operations with Whole Numbers: Paying Rent

Mikaela has lived in her apartment for 2 years and paid $841 per month in rent. Her best friend Paula has lived in her apartment for 1 year and paid $765 per month in rent. How much has each girl spent in rent during the time she has lived in her apartment?

If the friends move into an apartment together, and the apartment rents for $998 per month, how much total money would they save in rent in one year's time? Justify your reasoning.

Procedural	0	1	2
Conceptual	0	1	2
Communication	0	1	2

Total points:_____

Name _____ Date _____

Performance Task: 5.3B
Operations with Whole Numbers: Paying Rent

Mikaela has lived in her apartment for 2 years and paid $841 per month in rent. Her best friend Paula has lived in her apartment for 1 year and paid $765 per month in rent.

1. How many months are in one year of time?

2. How much did Mikaela spend in rent in 1 year?

3. How much did Paula spend in rent in 1 year?

4. How much did the two friends spend in rent altogether in 1 year?