**Name:** Cynthia Smith **Section:** ELED 310-1

**Content Standard.:** Numbers and Operations

**Topic:** Addition using Partial Sums/ Multiplication using Partial Products

**Grade Level:** 4 **Lesson Duration:** 1 hour, 40 minutes

**New Illinois CC Standards or Benchmarks & Descriptors:**

* CC.3.NBT.2 Use place value understanding and properties of operations to perform multi-digit arithmetic. Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction. (A range of algorithms may be used.)
* CC.4.NBT.5 Use place value understanding and properties of operations to perform multi-digit arithmetic. Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models. (Grade 4 expectations in this domain are limited to whole numbers less than or equal to 1,000,000.)

**Objectives:**

Students will:

1. Compare, demonstrate and solve addition/multiplication problems using base-10 blocks while working in pairs.
2. Demonstrate and solve addition problems using the partial sums method.
3. Demonstrate and solve multiplication problems using the partial products method.

**Materials:**

Teacher: Overhead projector, warm up question, base-10 blocks (rods and units) for each pair of students, Partial Sums & Partial Products Homework (w/ answer key), and Partial Sums & Partial Products QUIZ (w/ answer key).

For Each Student: Math journals, pencils, exit slip, and homework worksheet

**Terms/Definitions/Formulas:**

* Addition Using Partial Sums (a.k.a. Partition Addition): A method of adding that breaks the numbers into their place values.

 Example: What is 23 + 16?

|  |  |  |
| --- | --- | --- |
|  |  | 23 |
|  |  | + 16 |
| 1. Add 10’s
 | 20 + 10 =  | 30 |
| 1. Add 1’s
 | 3 + 6 =  | + 9 |
| 1. Add partial sums
 | 30 + 9 =  | 39 |

* Array: A rectangular arrangement of quantities in rows and columns.

Example: Factors of 16 (each arrangement below is an array)

 1 x 16 2 x 8 4 x 4

|  |
| --- |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |

|  |  |
| --- | --- |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

* Multiplication Using Partial Products (a.k.a. Partition Multiplication): A method of multiplication that breaks the numbers into their place values.

 Example: 34 x 26 = ?

 34(30 + 4)

x 26 (20 + 6)

 24 (1’s times 1’s)

180 (1’s times 10’s)

 80 (10’s times 1’s)

 + 600 (10’s times 10’s)

 700 (100’s place value total)

 180 (10’s place value total)

+ 4 (1’s place value total)

 884

**Warm-Up Problem & Solution:** (5 minutes)

Have the students complete the following story problem in their math journals.

Problem: “Tom and Jenna are making rolls for Thanksgiving dinner. If Jenna makes 15 whole wheat rolls and Tom makes 14 sourdough rolls, how many rolls will there be altogether?” (Answer: )

Ask the students to come up with as many ways to solve the problem as they can. Also have them explain in their journals, in full sentences, how they got their answer. Provide each student with base-10 blocks for him or her to use to solve the problem.

**Procedure:** (35 minutes)

**Introduction (Lead in/Motivation):** (15 minutes)

Read the following story problem to the class: “Chelsea bought 20 pieces of bubblegum and 5 jawbreakers at the store. Billy bought 10 pieces of bubblegum and 4 jawbreakers at the store.”

*How many pieces of candy do they have altogether?*

*Work with the person sitting next to you and try and figure out how many total pieces of candy there are. Use the base-10 blocks if you want.*

Give the students 1 minute to work on the problem.

*There are multiple ways to solve this problem. How would you solve it using base-10 blocks?*

*Let’s go back to the problem about Chelsea and Billy. Chelsea had a total of 25 pieces of candy. Billy had a total of 14 pieces of candy. How many pieces did they have altogether?*

*How would you show this using the base-10 blocks?*

Bubblegum Jawbreakers

|  |
| --- |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |

|  |
| --- |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |

|  |
| --- |
|  |

|  |
| --- |
|  |

|  |
| --- |
|  |

|  |
| --- |
|  |

Chelsea

|  |
| --- |
|  |

|  |
| --- |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |

|  |
| --- |
|  |

|  |
| --- |
|  |

Billy

|  |
| --- |
|  |

|  |
| --- |
|  |

*How many rods do we have?* (3) *How much do they represent?* (30)

*How many units do we have?* (9) *How much do they represent?* (9)

*What number is represent by the combination of the rods and units?* (30 and 9 make 39)

*For this lesson, we are going to discuss how to add two digit numbers by using the concept of partial sums and after we have gone through addition using partial sums we are going to practice multiplication using partial products, which is a very similar concept.*

**Development (Instruction/Activities/Demos):** (20 minutes)

Partial Sums

*So, what is the partial sums method? A method of adding that breaks the numbers into their place values*.

Note:This method is used to reinforce the place value concept.

*To solve a problem using the partial sums method we:* (write the following steps on the board for the students to copy in to their math journals.)

1. *Add the numbers in the 10’s place value*
2. *Add the numbers in the 1’s place value*
3. *Add the total from the 10’s place value to the total from the 1’s place value*

*These are the steps you follow for each partial sums problem. More steps are added on when you work with larger numbers but we will go over that a little later.*

*Let’s demonstrate the partial sums method for the problem about Chelsea and Billy.*

1. *Add the numbers in the 10’s place value;* 20 + 10 = 30*.*
2. *Add the numbers in the 1’s place value;* 5 + 4 = 9*.*

*Since we have no more place values past the 1’s, we must stop.*

1. *Add the total from the 10’s place value to the total from the 1’s place value;*

30 + 9 = 39

*Therefore, we have found the answer to our original problem,* 25 + 14 = 39. *Chelsea and Billy have a total of 39 pieces of candy.*

Partial Sums Solution:

|  |  |  |
| --- | --- | --- |
|  |  | 25 |
|  |  | + 14 |
| 1. Add 10’s
 | 20 + 10 =  | 30 |
| 1. Add 1’s
 | 5 + 4 =  | + 9 |
| 1. Add partial sums
 | 30 + 9 =  | 39 |

*Let’s try another example and solve it without using the table. If I had 24 students last year and 37 students this year, how many students have I had altogether?* (Answer: 24 + 37 = 61)

Explain the solution as you did the previous examples solution.

|  |  |  |
| --- | --- | --- |
|  |  | 24 |
|  |  | + 37 |
| 1. Add 10’s
 | 20 + 30 =  | 50 |
| 1. Add 1’s
 | 4 + 7 =  | + 11 |
| 1. Add partial sums
 | 50 + 11 =  | 39 |

Go over one more example with the students but a more difficult problem. For example, go over 234 + 56.

Partial Products

*Now that we have discussed partial sums let’s move on to partial products.*

Write the problem:4 x 6 = on the board. *Solve the problem and explain your reasoning.* (Answer: 24)

Write the problem:30 x 6 on the board. *Solve the problem and explain your reasoning.* (Answer: 180)

Write the problem:34 x 6 = on the board. *Solve the problem and explain your reasoning without using paper to solve this.* (Answer: 204)

*Can the first two equations help us to solve the last equation? How?* (The first two can be completed mentally, while the last one is not as easy to do without paper. But the addition of the first two totals gives you the answer for the last one.)

*Remember when we were learning about our multiplication facts and we created arrays?* Go over the definition of an array and provided example if necessary (provided in Terms/Definitions/Formulas).

Using the base-10 blocks, have student’s pair up and create a basic multiplication fact array such as 5 x 3. *How many columns do we have?* (5) *How many rows do we have?* (3) *What is our product?* (15 units) *How does this array help you solve the multiplication equation?*

*Given the following two digit by one digit multiplication problem, model the array using the base-10 blocks.* *Show the array for* 14 x 3*.* Students will work together to show 3 rows of 1 rod and 4 units.

*How can you look at this array to come up with the product?* (I can look at how many rods there are and how many units there are. There are 3 rods which means 3 tens or 30 and there are 3 rows of 4 units, which is 12. So the sum of 30 and 12 is 42.

Explain to the students that there is more than one way to solve a problem. *Another way to solve this problem is to break it up in to parts by using the partial products method.*

When multiplying, you can solve problems more easily when using the partial products method. The partial products method is *where you break up multiplication problems in to steps* (creating partial products), *multiply each place value by the other place value for each number in the problem, and then you combine their totals*.

One way to solve the problem you just did is to use the partial products method.

*First, write out the problem as the following:*

|  |  |
| --- | --- |
| 14 | (10 + 4) |
| x 3 |  x (+ 3) |

*We have split the numbers in to their place values. This will allow us to multiply the numbers more easily.*

|  |  |  |
| --- | --- | --- |
| 14 | (10 + 4) |  |
| x 3 |  x (+ 3) |  |
|  | 12 |  What is 3 x 4? |
|  | + 30 |  What is 3 x 10? |

*We have found our partial products. Now, we must add them up.*

|  |  |  |
| --- | --- | --- |
| 14 | (10 + 4) |  |
| x 3 |  x (+ 3) |  |
|  | 12 |  What is 3 x 4? |
|  | + 30 |  What is 3 x 10? |
|  | 42 |  What is 12 + 30? |

*We have completed a partial product example using a one-digit and a two-digit problem. We will work on many two-digit by two-digit problems so here are the steps to finding the correct answer.*

*The steps for solving a two-digit by two-digit partial products problem are* (write these steps on the board and have the students copy them in their journals):

 *Step 1: Multiply the 1’s by the 1’s and write the product.*

*Step 2: Multiply the 1’s by the 10’s and write the product.*

*Step 3: Multiply the 10’s by the 1’s and write the product.*

*Step 4: Multiply the 10’s by the 10’s and write the product.*

*Step 5: Add the partial products from steps 1-4 to get the final answer.*

Next, have the students work together to solve a two digit by two-digit problem, 22 x 13 = ?. Have them use the partial products method to find their answer.

*First, write out the problem as the following:*

|  |  |
| --- | --- |
| 22 | (20 + 2) |
| x 13 |  x (10 + 3) |

*Then follow the steps given for the partial products method.*

|  |  |  |  |
| --- | --- | --- | --- |
| 22 | (20 + 2) |  |  |
| x 13 |  x (10 + 3) |  |  |
|  | 6 |  What is 3 x 2? | 1’s times 1’s |
|  | 60 |  What is 3 x 20? | 1’s times 10’s |
|  | 20 |  What is 10 x 2? | 10’s times 1’s |
|  | + 200 |  What is 10 x 20? | 10s times 10’s |
|  | 286 |  What is the total? |  |

*Now that we have discussed the partial products method, if we go back to the original problem 34 x 6, do you think we can use the first two equations to find the answer for 34 x 6?*

*Yes!* Explain using the partial products method.

|  |  |  |
| --- | --- | --- |
| 34 | (30 + 4) |  |
| x 6 |  x (+ 6) |  |
|  | 24 |  What is 6 x 4? |
|  | + 180 |  What is 6 x 30? |
|  | 100 | 100’s place value total |
|  | 100 | 10’s place value total |
|  | + 4 | 1’s place value total |
|  | 204 |   |

*How do you solve a problem that uses larger numbers? For example,* 326 x 42 =? (You multiply each number in the second number by each number in the first number.)

|  |  |  |  |
| --- | --- | --- | --- |
| 326 | (300 + 20 + 6) |  |  |
| x 42 |  x (40 + 2) |  |  |
|  | 12 |  What is 2 x 6? | 1’s times 1’s |
|  | 40 |  What is 2 x 20? | 1’s times 10’s |
|  | 600 |  What is 2 x 300? | 1’s times 100’s |
|  | 240 |  What is 40 x 6? | 10’s times 1’s |
|  | 800 |  What is 40 x 20? | 10’s times 10’s |
|  | + 12000 |  What is 40 x 300? | 10’s times 100’s |
|  | 10000 |  10,000’s place value total |  |
|  | 2000 |  1,000’s place value total |  |
|  | 1600 | 100’s place value total |  |
|  | 90 | 10’s place value total |  |
|  | + 2 | 1’s place value total |  |
|  | 13692 | Total |  |

**Guided Practice:** (20 minutes)

As the students complete the problems, check the following: (1) Are they able to model the numbers correctly?, (2) Do they understand place value?, (3) Are they lining up their equations properly?, and (4) Are they able to get the correct answers? Checking these 4 things will ensure that the students are on task and actively engaged in the lesson. After all of the students have completed one or two of the problems go over the first problem. If any student was unable to complete the problem correctly spend a few minutes explaining the partial sums method to them again. Each student will solve the following problems using the partial sums, the partial products method, or both. #1 and #6 are shown as examples.

1. 39 + 48 = ?

|  |  |
| --- | --- |
| 39 |  |
| + 48 |  |
| 70 | What is 30 + 40? |
| + 17 | What is 9 + 8? |
| 87 |  |

1. 23 + 66 = ?
2. 14 + 30 = ?
3. 720 + 76 = ?
4. 672 + 123 = ?
5. 42 x 27 = ?

|  |  |  |
| --- | --- | --- |
| 42 | (40 + 2) |  |
| x 27 |  x (20 + 7) |  |
|  | 14 | What is 7 x 14? |
|  | 280 | What is 7 x 40? |
|  | 40 | What is 20 x 2? |
|  | + 800 | What is 20 x 40? |
|  | 1000 | 100’s place value total |
|  | 130 | 10’s place value total |
|  | + 4 | 1’s place value total |
|  | 1134 |  |

1. 63 x 48 = ?
2. 56 x 19 = ?
3. 78 x 29 = ?
4. 85 x 30 = ?

**Closure:** (5 minutes)

* *Who can tell me what the partial sums method is?* (A method of adding that breaks the numbers into their place values.)
* *Who can tell me the steps for a partial sums problem that is a two-digit by two-digit?* (Step 1: Add the tens and write the sum. Step 2: Add the ones and write the sum. Step 3: Add the tens and ones to get the final answer.)
* *Who can tell me what the partial products method is?* (Multiplication using the partial products method is where you break up multiplication problems in to steps (creating partial products), multiply each place value by the other place value for each number in the problem, and then you combine their totals.)
* *Who can tell me the steps for a partial products problem that is a two-digit by two-digit?* (Step 1: Multiply the 1’s by the 1’s and write the product. Step 2: Multiply the 1’s by the 10’s and write the product. Step 3: Multiply the 10’s by the 1’s and write the product. Step 4: Multiply the 10’s by the 10’sand write the product. Step 5: Add the partial products to get the final answer.)

Have the students fill out the exit slip prior to leaving the classroom.

* Exit Slip: What were the two main concepts you learned today? Do they make adding and multiplying easier? Why or why not?

**Differentiated Instruction (Adaptation):**

1. Modifications/accommodations for ESL or ELL students
* Allowing the students to work in pairs during each activity.
* Providing base-10 blocks for the students to use during the activities will help clarify and reinforce the concept.
* Provide a mathematics dictionary with terms and concepts.
* Allow more time to process questions, answers, and assignments.
* Use visuals whenever possible to reinforce auditory instruction,
1. Modifications/accommodations for special needs students
* Show visually, by writing on the board, the mental math part of the partial sums and partial products procedures.
* Provide extra explanation and example problems to those who need it.
* Invite a specialist to join the student during this lesson, providing guidance during the transfer and connection of the concept to the procedure.
* Allow students to work in small groups during each activity.
1. Modifications/accommodations for gifted students
* Provide challenging word problems instead of the standard math problems for the students to create a deeper understanding of the use of partial sums and partial products.
* Provide three-digit by three-digit partial sums problems for the students to work on.
* Provide three-digit by two-digit partial product problems for the students to work on.

**Homework:**

The following questions should be completed for homework (Partial Sums & Partial Products

Homework Worksheet).

Directions: Answer each problem below and show ALL work using the partial sums, partial products methods, or both.

Partial Sums

1. Bishop is reading *James and the Giant Peach* by Roald Dahl*.* He read 43 pages yesterday and 59 pages today. How many pages has Bishop read altogether?
2. Mary is reading *Homesick* by Jean Fritz. She read 93 pages yesterday and 83 pages today. How many pages has Mary read altogether?
3. Amanda has 27 books about cars and 61 books about motorcycles. How many books does Amanda have altogether?
4. Myles read 95 books last year and 69 books this year. How many books did Myles read altogether?

Partial Products

1. There are 34 rows and 15 columns in the school auditorium. How many chairs are there altogether?
2. The movie theatre has 33 rows and 40 columns. How many people can sit in the theatre?
3. There are 16 classrooms with 29 chairs each. How many students can sit in the classrooms altogether?
4. In Calculia, IL there are 48 houses on each street and there are 73 streets. How many houses are there in Calculia, IL?

**Assessment:**

Formal

* Students worked in pairs to represent and calculate addition and multiplication problems using rods, units, and arrays during the development of the lesson with 80% accuracy.
* Students accurately calculated addition and multiplication problems first using base-10 blocks, then using the partial sums and products methods and recording their answers during the lesson, HW and on a quiz.

Informal

Walk around the room while students are participating in the activities. Look for the following:

1. Are they able to model the numbers correctly?
2. Do they understand place value?
3. Are they lining up their equations properly?
4. Are they able to get the correct answers?

**Evaluation Task:** (35 minutes)

11 questions are to be given as a quiz to assess each students understanding of the concept taught. The first ten the students should be able to complete and the last problem is a challenge problem. The problems should be completed using the partial sums method, the partial products methods, or both.

(1) Jenn is reading *The Pen is Mightier than the Sword* by Anne Mazer*.* She read 64 pages yesterday and 82 pages today. How many pages has Jenn read altogether?

(2) Keith read 37 books last year and 59 books this year. How many books did Keith read altogether?

(3) 41 + 74 =

(4) 89 + 63 =

(5) 37 + 96 =

(6) In Perimeta, IL there are 23 houses on each street and there are 35 streets. How many houses are there in Perimeta, IL?

(7) There are 37 rows and 44 chairs in each row in the school auditorium. How many chairs are there altogether?

(8) 62 x 25 =

(9) 74 x 31 =

(10) 58 x 26 =

(11) Challenge problem: Eddie has a total of 234 on four exams, where as Nic has a total of 325 points on four exams. What are Eddie’s and Nic’s scores combined?

**Technology Connection:**

The following is a partial products game found at learning.com. The game has student’s answer three two-digit by one-digit partial products problems during the first round and the problems get more difficult as the levels go on. They must solve the problems to reach the top of the building to rescue an animal that is trapped.

This game can be played after the students have finished other activities. This game may also be a way to accommodate the students with special needs who may have difficulty writing.

Pet Rescue Hotel, learning.com, 2012, http://flash.learning.com/ahamath-demo/Pet-Rescue-Hotel-I/SCORMDriver/indexAPI.html

**Reflection/Next Steps:**

1. For students who demonstrate mastery:

Have the students work on problems that incorporate larger numbers; i.e., 324 + 968,

456 x 54, etc.

The students can go on to work on the partial differences method as well as the partial quotients method.

1. For students who need more practice:

Re-explain how to complete partial sums and partial products examples.

Have the students begin from a simple partial sums and partial products problem and work there way up to more difficult problems.

Providing the students with a times table sheet may also be helpful.

**References:**

The University of Chicago School Mathematics Project. (1999). *Everyday Mathematics Teacher's Reference Manual Grades 4-6*. Chicago, IL: Everyday Learning Corporation. Pg. 127-132

The University of Illinois at Chicago. (1997). *Math Trailblazers: Grade 3 Unit Resource Guide, Unit 19 Multiplication and Division Problems* (2nd ed.). Chicago, IL: Kendall/Hunt Publishing Company.

http://everydaymath.uchicago.edu/

http://www.math.nyu.edu/~braams/links/em-arith.html

http://www.uen.org/Lessonplan/preview.cgi?LPid=21446

http://t-mates.wikispaces.com/Online+Math+Games

Warm-up Problem

Tom and Jenna are making rolls for Thanksgiving dinner. If Jenna makes 15 whole wheat rolls and Tom makes 14 sourdough rolls, how many rolls will there be altogether?

Warm-up Problem ***Solution***

Multiple ways to solve the problem:

(1) 15 + 14 = 29

(2) 15 + 14 = 10 + 5 + 10 + 4 = 10 + 10 + 5 + 4 = 20 + 9 = 29

(3) 1 rod and 5 units plus 1 rod and 4 units = 2 rods and 9

units, which is 20 + 9 = 29.

 (4) 15

+ 14

20

+ 9

 29

Guided Practice

1. 39 + 48 =
2. 23 + 66 =
3. 14 + 30 =
4. 720 + 76 =
5. 672 + 123 =
6. 42 x 27 =
7. 63 x 48 =
8. 56 x 19 =
9. 78 x 29 =
10. 85 x 70 =

Exit Slip

What were the two main concepts you learned today?

Do they make adding and multiplying easier? Why or why not?

Partial Sums & Partial Products

Homework

Directions: Answer each problem below and show ALL work using the partial sums and partial products methods.

1. Bishop is reading *James and the Giant Peach* by Roald Dahl*.* He read 43 pages yesterday and 59 pages today. How many pages has Bishop read altogether?

Bishop has read \_\_\_\_\_ pages of *James and the Giant Peach*.

1. Mary is reading *Homesick* by Jean Fritz. She read 93 pages yesterday and 83 pages today. How many pages has Mary read altogether?

Mary has read \_\_\_\_\_ pages of *Homesick*.

1. Amanda has 27 books about cars and 61 books about motorcycles. How many books does Amanda have altogether?

Amanda has \_\_\_\_\_ books about cars and motorcycles.

1. Myles read 95 books last year and 69 books this year. How many books did Myles read altogether?

Myles has read \_\_\_\_\_ books this year and last year.

Partial Sums & Partial Products

Homework Continued

1. There are 34 rows and 15 columns in the school auditorium. How many chairs are there altogether?

There are \_\_\_\_\_ chairs in the auditorium.

1. The movie theatre has 33 rows and 40 columns. How many people can sit in the theatre?

\_\_\_\_\_ people can sit in the theatre.

1. There are 16 classrooms with 29 chairs each. How many students can sit in the classrooms altogether?

\_\_\_\_\_ students can sit in the classrooms.

1. In Calculia, IL there are 48 houses on each street and there are 73 streets. How many houses are there in Calculia, IL?

There are \_\_\_\_\_ houses in Calculia, IL.

Partial Sums & Partial Products

Homework - ANSWERS

Directions: Answer each problem below and show ALL work.

1. Bishop is reading *James and the Giant Peach* by Roald Dahl*.* He read 43 pages yesterday and 59 pages today. How many pages has Bishop read altogether?

43

+ 59

90

+ 12

102 Bishop has read 102 pages of *James and the Giant Peach*.

1. Mary is reading *Homesick* by Jean Fritz. She read 93 pages yesterday and 83 pages today. How many pages has Mary read altogether?

93

+ 83

170

+ 6

176 Mary has read 176 pages of *Homesick*.

1. Amanda has 27 books about cars and 61 books about motorcycles. How many books does Amanda have altogether?

27

+ 61

80

+ 8

88 Amanda has 88 books about cars and motorcycles.

1. Myles read 95 books last year and 69 books this year. How many books did Myles read altogether?

95

+ 69

150

+ 14

164 Myles has read 164 books this year and last year.

Homework – ANSWERS Continued

1. There are 34 rows and 15 chairs in each row in the school auditorium. How many chairs are there altogether?

(30 + 4)

x (10 + 5)

20

150

40

+ 300

510 There are 510 chairs in the auditorium.

1. The movie theatre has 33 rows and 40 chairs in each row. How many people can sit in the theatre?

(30 + 3)

x (40 + 0)

0

0

120

+ 1200

1320 1320 people can sit in the theatre.

1. There are 16 classrooms with 29 chairs each. How many students can sit in the classrooms altogether?

(10 + 6)

x (20 + 9)

54

90

120

+ 200

464 464 students can sit in the classrooms.

1. In Calculia, IL there are 48 houses on each street and there are 73 streets. How many houses are there in Calculia, IL?

(40 + 8)

x (70 + 3)

24

120

560

+ 2800

3504 There are 3504 houses in Calculia, IL.

Partial Sums & Partial Products

QUIZ

**Directions:** Solve the following problems using the partial sums method, the partial products method, or both.

(1) Jenn is reading *The Pen is Mightier than the Sword* by Anne Mazer*.* She read 64 pages yesterday and 82 pages today. How many pages has Jenn read altogether?

Jenn has read \_\_\_\_\_\_\_ pages altogether.

(2) Keith read 37 books last year and 59 books this year. How many books did Keith read altogether?

Keith read \_\_\_\_\_\_\_ books last year.

 (3) 41 + 74 =

(4) 89 + 63 =

(5) 37 + 96 =

Partial Sums & Partial Products

QUIZ continued

(6) In Perimeta, IL there are 23 houses on each street and there are 35 streets. How many houses are there in Perimeta, IL?

There are \_\_\_\_\_ houses in Perimeta, IL.

(7) There are 37 rows and 44 chairs in each row in the school auditorium. How many chairs are there altogether?

There are \_\_\_\_ chairs in the school auditorium.

(8) 62 x 25 =

(9) 74 x 31 =

(10) 58 x 26 =

(11) **Challenge problem**: Eddie has a total of 234 on four exams, where as Nic has a total of 325 points on four exams. What are Eddie’s and Nic’s scores combined?

Partial Sums & Partial Products

QUIZ ~ ANSWERS (1-6)

(1) 64 + 82 =

64

+ 82

140

+ 6

 146 Jenn has read 146 pages altogether.

(2) 37 + 59 =

37

+ 59

 80

+16

 96 Keith read 96 books last year.

(3) 41 + 74 =

41

+ 74

 110

+ 5

 115

(4) 89 + 63 =

89

+ 63

 140

+ 12

 152

(5) 37 + 96 =

37

+ 96

 120

+ 13

 133

(6) 23 x 35 =

23(20 + 3)

x 35 (30 + 5)

15

100

 90

+600

 805 There are 805 houses in Perimeta, IL.

Partial Sums & Partial Products

QUIZ ~ ANSWERS (7-11)

(7) 37 x 44 =

37(30 + 7)

x 44 (40 + 4)

 28

1 20

 280

+ 1200

1628 There are 1628 chairs in the school auditorium.

(8) 62 + 25 =

62(60 + 2)

x 25 (20 + 5)

 10

 300

 40

+ 1200

1550

(9) 74 x 32 =

74(70 + 4)

x 31 (30 + 1)

 4

 70

120

 + 2100

 2294

(10) 58 x 26 =

58(50 + 8)

x 26 (20 + 6)

 48

300

 160

 + 1000

 1508

(11) Challenge problem: Eddie has a total of 234 on four exams, where as Nic has a total of 325 points on four exams. What are Eddie’s and Nic’s scores combined?

234

+ 325

500

50

+ 9

559