Multiplication of four digit by one digit numbers

Grade 4
Total Time: 1 hour

I. Topic: An introduction to Multiplying greater numbers in which the students will use their previous knowledge in multiplying three-digit numbers by one-digit numbers.

II.OBJECTIVES/STANDARD

- **Objective**: Given 5 multiplication stations, TSWBAT correctly solve and create word problems multiplying four digit numbers by one digit numbers or three digit numbers by one digit numbers and complete the corresponding group worksheet to 90% accuracy.
- **Goal:** Students will begin to understand that multiplying four digit numbers by one digit numbers is very similar to multiplying three digit numbers by one digit numbers, except that we are adding one more place value. Students will activate prior knowledge using regrouping and understand the concepts behind four digit multiplication.
- **PDE 2.1.4.F**- understand the concepts of addition and subtraction and their inverse relationships: understand concepts of multiplication and division use the four basic operations to solve problems including word problems and equations.
- **NCTM Content Standard**- Develop fluency in adding, subtracting, multiplying and dividing whole numbers.

III. TEACHING PROCEDURES

Launch : (5-10 minutes)

- Have the students listen to the teacher as she reads Charlie and the Chocolate Factory. Teacher will read **(part of page 63 and part of page 68).** The teacher will already have the exercise problem written on the board to explain to the students.
- **In order to step into the doors of the chocolate factory today, you are going to have to solve a 4 digit by one digit multiplication problem which is the concept we are going to teach today. Before we move on to this concept however, can anyone come up to the board and help me solve the three- digit by one digit multiplication problem?**

- The teacher will call on a student to volunteer to come up to the board and complete the exercise problem reviewing yesterday's concept. The rest of the students will complete this problem on a piece of notebook paper. The teacher will have the student call on other classmates if she/he needs extra help. The teacher will make sure that the students understand the procedural method while asking them questions that pertain to the concepts behind the multiplication problem. **(Ex. Problem: 623 x 4 = 2,492)-Bri**
- After the problem is completed, the teacher will answer any questions that the students have regarding this problem. The teacher will then focus the lesson into solving 4 digit by one digit multiplication problem.
- **Nice work, everyone! Today we are going to be focusing on lesson that is similar to yesterday's lesson.** Ask: **If you look at the board and compare the problem we just completed as a class to the new problem written beside it, what seems to be the difference? (**Answer: The new problem has one more digit than the other problem. The new problem adds a new place value in the thousands.)
- Ask students: **Looking up at the board, I need everyone to now copy this new problem in their math notebook.** Wait for further instructions until all students are done. **New problem:** (1,956 x 2)
- Ask: **Can anyone tell me what our first step is in solving this new problem?** (Answer: The first step you must take is to multiply the tens and the ones. **Excellent. We need to multiply the 6 and the 2.**
- **Ask: What does 6 x 2 equal?** (Answer: it equals 12). **Good. However, since 12 is greater than 10 we must regroup. We are going to regroup 1 bundle of 10 with 2 left over.**
- **Ask: What is the second step in solving this problem? Do we have to regroup?** (Answer: the next step is to multiply 5 and 2 to get 10. Then you have to add the 1 ten that was carried over so the answer is now 11. Regroup 11 tens as 1 hundred and 1 ten.
- **Ask:** What is step three in solving this problem? Do we have to regroup?

  (Answer: the next step is to multiply the hundreds together. 9 x 2 is 18 hundreds plus the one hundred is 19 hundreds. 19 is more than ten so we regroup 19 into 1 thousand and 9 hundreds.

- **Ask:** What is the fourth and final step in solving this problem? (Answer: the final step is to multiply the thousands. 2 x 1 is 2 thousands plus the 1 thousand is 3 thousand.) The final answer is 3, 912.
- **Before we allow you to enter the rooms of the chocolate factory with your groups, I am going to put one more 4 digit by one digit multiplication problem on the board. I want everyone to try to solve this problem individually on their piece of graph paper or notebook paper. Remember to regroup if you need to regroup and add the numbers that are carried over.** (Here is the problem: 4517 x 2)-**Bri**

Explore (10-30 minutes)

- On each of the groups of desks, set up one of the five centers. These five activities will serve as the five rooms in Willy Wonka's factory. *See "Multiplication Centers" attachment.*
- **Now that everyone has earned their golden ticket into the factory we have an important activity for all of you. On each of the tables there is a basket which has the multiplication activity, game or problem that you are supposed to complete within 5 minutes. There are five rooms: 1. the chocolate room, 2. the inventing room, 3. the great gum room, 4. the nut room, 5. The glass elevator room.**
- **Everyone has been given a worksheet that explains the directions for each station. Some of the stations require answers, and some of them do not. We will let you know when it is time to switch to the next center; we will rotate clockwise around the classroom.**
- Have the students read all directions very carefully. Constantly walk around the classroom answering questions and closely focusing on any signs of inattentiveness or confusion.
- After completing the centers, the students will participate in "board races" to earn points for their team. In addition, the teacher will pass out an independent worksheet to complete for homework for bonus points.

Summarize (10-15)

- After the students have rotated through all five stations, the students are to complete their worksheet and wait until everyone has done the same.
- The teacher will go through each activity individually and ask the students what problems they thought were challenging or not so challenging about the center process. Students should discuss what strategies they used to complete the problem. If a student has a question about a particular problem, it is the job of the teacher to answer these questions in a clear cohesive manner.

TEACHER EVALUATION

- How did we prepare this lesson to ensure the students clearly understood the concept of four digit multiplication?
- Did our assessments accurately measure the students' knowledge of multiplication?
- Were we professional in the way we interacted with my students?
- What activities and strategies worked well during our lesson?
- What changes would we make if we taught this lesson again?

STUDENT EVALUATION

- Were the students able to understand the principles of regrouping with four digit multiplication? What about three digit multiplication?
- Were the students able to understand the new concepts of four digit by one digit multiplication?
- How were the students actively involved in understanding this lesson?

Stations-Wednesday, November 16th

1**. Candy Flashcards:**

There will be two sets of cards at the station with numbers 1-9 on them. Taking turns, two people will each hold up a card, and the other two or three group members will race to solve the problem. The person who solves it fastest gets a point, which they can record with a tally on their piece of paper. The people who hold up the cards will rotate around the circle, and at the end the person with the most tallies wins.

Materials:

- Number cards (2 sets)
- Instruction sheet
- Sheet for tallies

2. **Wonka Word Problems:**

Each student will get a laminated template with blanks they can fill in with dry erase marker to write their own word problem. They will then exchange their problem with someone else in the group. Time permitting, after solving the problem the students can raise their hands and a teacher will come check their work. If they got the problem right, they can illustrate it.

Materials:

- Instruction sheet
- 5 laminated word problem templates

3. **Race to Sweet Solutions:**

At the table will be cards with problems on one side and the answers on the back. Each student will pick a card and solve. If the student gets it right they get a point which can be recorded on their tally sheet. The person with the most points wins.

Materials:

- Instruction Sheet
- Cards with problems on one side and solutions on the back
- Sheet for tallies

4. **Tasty tens, ones and hundreds**

The students will be given a sheet with two 2 digit multiplication problems on it. They will solve these using based ten blocks, and will have the option of either working with the blocks, then drawing them, or just drawing them. Regardless, they must show this regrouping on their paper. Provide an example problem on the table.

Materials:

- Instruction sheet
- Tasty Tens, Ones and Hundreds worksheet
- Example problem

5. **Scrumptious Shakers**

There will be two egg cartons on the table, with a marble in each. In one egg carton, single digit numbers will be written. In the other, 2, 3, and 4 digit numbers will be written. The students will shake each carton and record the numbers, forming a multiplication problem. Have the students write down the numbers they get and solve on their graph paper, then compare answers. Miss Sloan and Miss Amoscato will be walking around available to check the students' answers.

Materials:

- Instruction sheet
- Two egg cartons with numbers written in each section
- Two marbles
- Graph paper