

Lesson Plan Two

Methods II – Fall 2008

Basic Information	
Name: <u>Ashley Anderson</u>	Clinical Supervisor: <u>Tisha Kreyenbuhl</u>
Date to Be Taught: <u>October 15th, 2008</u>	Lesson Plan #: <u>Two</u>
Date Due: <u>October 8th, 2008</u>	Topic: <u>Missing Factors- Whole Group (Math)</u>
Email: <u>aander56@georgiasouthern.edu</u>	Telephone: <u>912-541-3061</u>
Established Goals - Standards	
<p>NS:</p> <p><u>NM-ALG.3-5.2</u> Represent and analyze mathematical situations and structures using algebraic symbols</p> <ul style="list-style-type: none"> • represent the idea of a variable as an unknown quantity using a letter or a symbol; • express mathematical relationships using equations. <p>GPS:</p> <p>M3A1 Students will use mathematical expressions to represent relationships between quantities and interpret given expressions.</p> <p>c. Use a symbol, such as Y and Δ, to represent an unknown and find the value of the unknown in a number sentence.</p> <p>M3N3 Students will further develop their understanding of multiplication of whole numbers and develop the ability to apply it in problem solving.</p> <p>c. Use arrays and area models</p> <p>g. Solve problems requiring multiplication.</p>	
Essential Question(s)	
<p>1. How do an array and a multiplication table assist you in finding a missing factor in multiplication problem?</p>	
Key Knowledge & Skills	
<p>The students <u>will know:</u></p> <p>Key Terms: Add in, Array, Column, Factor, Multiplication, Product, Row, Table.</p> <ul style="list-style-type: none"> • How to use counters to make an array • How to solve a missing factors problem using an array 	<p>The students will be <u>able to:</u></p> <ul style="list-style-type: none"> • Use counters to make an array • Solve a missing factors problem using an array. • Use a multiplication table • Locate the products on the multiplication table

<ul style="list-style-type: none"> • How to use a multiplication table. • Where the products are located on a multiplication table. • Where the factors are located on the multiplication table. • When you locate the given factor in either the factor row or the factor column and then locate the product. The product will be in missing factor will be in the missing factors row or column. 	<ul style="list-style-type: none"> • Locate the factors on a multiplication table. • Find a missing factor using a multiplication table when you have the product and one factor.
--	---

Assessment Method

The students will be assessed throughout the lesson by answering questions, modeling the missing factor problems with arrays made out of Smarties, modeling the missing factor problems by painting on the multiplication table, and by completing individual practice worksheets. During the lesson the teacher will informally assess students' responses on a checklist. The students' independent problems and turkey coloring worksheet can be used as a formal assessment to see if any students are having problems understanding the content.

Materials

- Morning Class:
- ✓ Popsicle sticks with students' names on them.
 - ✓ Interwrite board
 - ✓ PowerPoint
 - ✓ Erasable marker
 - ✓ Laminated mini multiplication charts
 - ✓ 33 A-Array Worksheets
 - ✓ 33 B-Array Worksheets
 - ✓ 33 Missing Factors Turkey Worksheet
 - ✓ Paint
 - ✓ Paint Brushes
 - ✓ Supersized Multiplication Tables
 - ✓ Smarties candy
 - ✓ Cards with missing factors problems on them
 - ✓ Cards with missing factors answers on them
 - ✓ Crayons

Advanced Technology

An Interwrite board will be used throughout the lesson

- To display questions.
- To display the manipulatives the teacher will use.

Time Span

60 Minutes total

Morning Class:

8:15 - 8:20 - Introduction

8:20 - 9:10 - Procedure

9:10 - 9:15 - Conclusion

Afternoon Class:

12:15 - 12:20 - Introduction

12:20 - 1:10 - Procedure

1:10 - 1:15 - Conclusion

Time Contingencies

If the lesson is running short, students will have the opportunity to play the multiplication mystery game from last week on the Interwrite board. Or they can share the turkeys they colored by picking one of the problems on the worksheet and working it out for the class.

If the lesson is running over, students will not completely finish the turkey worksheet. They can take it home to finish or do at a later time.

Early finisher activity:

If students finish the individual worksheets early than they will be told to flip over the worksheet and try and make up some questions to challenge the teacher.

If the students finish the turkey worksheet early they will be told to draw whatever they would like but make it into sections and write problems in the sections with a color key just like the turkey worksheet.

Behavior Management

The physical arrangement: Students will be sitting at their desks for this lesson.

Summary of CS's Plan: First the student gets a warning, if the behavior continues the students receives one mark which equals ten minutes off of recess, two marks equals twenty minutes, three marks equals all of recess, four marks equals all of recess and a call home.

Specific plan for this lesson:

Proactive management measures: The students will be reminded before I ask a question to raise their hands if they want to answer. They will not be called on if they raise their hand in a manner disturbing the other students. Students will also be reminded to use a classroom level of talking while working with a partner and using the Interwrite board. I also will be using a jar that I will put marbles in when they are on task and following directions. Once the Jar reaches the red line

the whole class will receive a popcorn party.

For this lesson students will be reminded not to eat, throw, or flick their Smarties at any student. They will be reminded that they do not need to use the paint inappropriately when solving problems. They will also be reminded that they do not need to push or shove when trying to find their partner during the conclusion activity.

Reactive management measures: Students who are acting inappropriately will be asked what they should be doing. For example, if they are calling out answers I will ask them how they should be acting if they want me to listen to what they have to say. If the student continues to act inappropriately they will be given one mark.

Transitions (into lesson, during lesson, after lesson):

For the morning class they will be doing their morning work at their desks. I will signal students by saying clap once if you can hear me. I will then ask them to quietly put the materials on their desks away before I start the lesson. The afternoon class will be coming back from lunch. When we are walking into the classroom I will instruct them to quickly and quietly put their lunch boxes and books away and have all eyes and ears on me so we can begin the lesson.

During the lesson the students will remain seated at their desk. When I call for volunteers to come to the front of the class they will tiptoe back to their seats.

When moving students by group to either make arrays or do the conclusion activity they will be called up by their rows group number.

Modifications for Diverse Learners

Lower Level Learners: When doing the individual worksheet to practice the arrays students who are having trouble will be given worksheet B. It has fewer and easier problems so it will be on their level and it will also not overwhelm them. Ms. McPeck, the EIP teacher, and the ESOL teacher will also be in the classroom to assist their students.

Higher Level Learners:

When doing the individual worksheet to practice the arrays students who are understanding the content will be given worksheet A. It has more challenging problems that way they will not just rush through it while the other students are still working. It is more on their level and they will feel challenged by it but not overwhelmed.

Specific Students:

Morning Class:

Students #12 and #5 have reading difficulties so the teacher will read all directions aloud for the worksheets.

Students #1, #3, #6, and #14 have attention difficulties so the teacher will monitor their progress to make sure they are staying on task.

Student #7 has Asperger's Syndrome. I will write the schedule for the lesson on the board so he will know where we are at in the lesson and what is coming up next. I will also have the teacher talk to him before the lesson to let him know that I will be teaching that day so he will not have any unexpected change in schedule.

Afternoon Class:

Student #1 is an ESOL student who speaks Spanish at home. I will check on him occasionally to see if he needs any directions or questions read to him.

Student # 19 has attention difficulties so the teacher will monitor his progress to make sure he is staying on task.

Teacher will say Teacher will say	Students' Response <i>Students' Response</i>	Narrative Narrative
---	--	-------------------------------

Introduction: the attention-getting component

1. Behavior expectations:

Good Morning/Afternoon! I need you to put away anything that you have out on your desk and then have your eyes and ears on me please. I will give students a few moments to put away morning work, books or items from lunch. **Great job. Now as you remember from last week when I see someone who is following directions or staying on task I am going to put a marble in this jar. If you are asking me to have a marble that means you are not doing what? *Doing our work.* Great! And don't forget when the jar is filled up to the red line we are going to have a popcorn party!**

2. Hook:

Okay I need _____, to come up here and tell me, including yourself, how many students are in our class. *Fourteen.* Okay 14 total people. Well I have twenty-eight stickers in my hand and I want to make sure everyone gets the same amount. I am first going to give everybody one sticker. The teacher will give everyone one sticker. **Now I still have some left over so ill go around again.** The teacher will give another sticker to the students. **Now how many does everyone have? *Two stickers.* Yes, everyone has two stickers. Okay, _____ you may have a seat. Let's look at this on the board. If we have fourteen students, (Teacher will write $14 \times$ on the board) and I had twenty-eight stickers (Teacher will write $= 28$ on the board) how many did each student get? *Two stickers.* Right! Guess what, you just did a missing factor or missing addend problem. We had $14 \times \underline{\quad} = 28$. When we gave out the stickers we figured out that 14 students who have a teacher with 28 stickers will each get two stickers. Two is our missing factor.**

3. Essential question introduction:

Today our essential question is how does an array and a multiplication table assist you in finding a missing factor in multiplication problem?

Procedure: the body of the instruction

Let's look at this problem with some manipulatives. The teacher will direct students' attention to the PowerPoint. **We had fourteen students in the classroom so will have 14 rows. Now we don't know how many columns we need to have but we know that we have twenty-eight total stickers. So keep giving the stickers out to all the students. Now that we are out of counters how many are in each column. Two! Great Job. Let's model an array as a class with our bodies. We will pretend that our bodies are the counters and we have to put ourselves into rows and columns to represent the problem. If there are 4 candy bars in each**

box, how many boxes should Brittany buy in order to get 8 total candy bars? Okay so what is our total number or the product? *Eight candy bars.* Right so we need eight people. The teacher will draw eight popsicle sticks to determine the eight people that will come up to demonstrate the problem. **Our other number is one of our factors. So $4 \times \underline{\quad} = 8$. We need 4 rows, with how many in each row?** *Two in each row.* Great, so our missing factor is two. $4 \times 2 = 8$! The teacher will do the other body array problem on the PowerPoint in the same way.

Okay now that we have used our bodies to make arrays we are going to practice some problems with manipulatives. Today we are going to get to use Smarties candy for counters. However, we will not be eating the candy during the lesson. If you do eat them you won't have any counters to make your arrays. We will also not put them in our noses or in our ears and we will not throw them at anyone. If you do not follow these rules I will replace the Smarties with plain plastic counters. At the end you will throw those away and I will give you some new ones you can eat.

Let's look at our first question. Jake is canning pears. He can put 5 pears in each jar. If he has 15 total pears, how many jars will he need? How many counters will we need? *Fifteen counters.* Great. The teacher will write $\underline{\quad} \times \underline{\quad} = 15$. Do we know one of our factors? *Yes, one of our factors is five.* Great so we can fill in one of our blanks. $5 \times \underline{\quad} = 15$. How many rows do we need? *Five rows.* Right. So give out the rest of the counters to the rows. How many are in each row? *Three counters are in each row?* Very good. Let's look at another problem. Chad put 4 stamps on each letter he mailed. If Chad used 16 stamps in all, how many letters did he mail? Work this problem by yourself and raise your hand to be checked. The students will work this problem and the next one. When they have the array on their desk they will raise their hand to be checked by a teacher. Once the teacher has checked them they can go on to the next problem. If a student is not getting the right problem then the teacher can assist them in getting the right answer. **Once you are done with both problems I have a worksheet for you to do. I will give it out to you once you have been checked. You need to draw the array and the number sentence you used to solve the problem. Once you have finished the worksheet you can make up some missing factors problems on the back.**

Okay now that we are all finished I need you to throw away your Smarties. The teacher will call the students up by row. Then the teacher will let each student have two Smarties pieces per person.

Let's look at another problem on the PowerPoint. There are 8 equal stacks of magazines in the library. How many magazines are in each stack if there are 80 magazines total? So if we were going to do an array with this problem how many counters would we need? *Eighty Counters.* Right, that's a lot of counters. Sometimes problems are going to be too big to use counters. So what do you think we could use to help up solve the problem? *A multiplication table.* Right, a multiplication table. The teacher will get out a big multiplication table that students will use to solve the problem. **_____ , where are our factors located on a multiplication table?** *On the top row and left column.* Right. I am going to circle all of our factors in blue. The teacher will use a marker to circle the factors in blue. Okay who can tell me where the products are located? *All the other numbers are the products.* Very good. I will color the products in orange. The teacher will use a marker to color the products orange. Then

the teacher will hang the chart in the room to use as a key for students to refer to. **Now let's look back at our problem. If it says eighty magazines total, is that one of the things we are multiplying together or is that our total number. Our total number. Right, and the answer or total number is called our product. So we need to find eighty on our multiplication chart in the orange zone.** The teacher will circle the eighty in orange paint. **And what is the other number in our problem. Eight. Okay so we go over here to the side and draw a line to the eight.** The teacher will circle that in blue. **When you locate the given factor in the factor row the product will be in missing factor will be in the missing factors column. So now all you have to do to find the other factor is draw a line straight up from your product.** The teacher will then draw an orange line to the number ten. **So ten is our missing factor.** The teacher will circle it in blue. **So if there are 8 equal stacks of magazines in the library and 80 magazines total then there are 10 magazines in each stack.** The teacher will then call students up to complete three more problems. The students will use the color coded paint to help determine which numbers are the factors and which ones are the products. After they have done the three other problems they will do the turkey worksheet. **Okay, class I have a really fun worksheet for you to do. You are going to solve the problems to color the turkey. Solve the problem; you can use your mini multiplication chart to help you. Then match your number to the key at the bottom. Whatever colors your answers corresponds to is the color you are going to color that part of the turkey.**

Conclusion: review, summarize, share, reflect, and project about learning

When students turn in their worksheets they will be given a necklace that has a card on it. Some students will have number sentences and some will have the answers to the number sentences. **Okay class, the ones of you who have number sentences come to the left side of the room. The ones that have the products come to the right side of the room. Someone on the opposite side of the room than you has the missing part to your problem. On the count of three you will have to try and find your partner. When you find your partner stand next to each other and someone will come and check you. Then you will go back and have a seat at your desk.** Once students have completed the activity.

Great, you all did a really good job! Who can tell me how we use arrays to solve a missing factors problem. _____, Your total number is how many counters you need to get out. Then you put your counters in the number or rows your factor is. Then you give all the counters out and add the numbers of columns you have created. That will be your missing factor. Great, who can tell me how we use a multiplication chart to solve a missing factors problem. _____, First you find your product on the chart. Then you go over the left column and find one of the factors. Then you go up from the product to find the missing factor. Very good! Who can point to where the factors are located on the multiplication chart. _____, Great! Who can point to the products on the multiplication chart? _____, Great! Great Job! You all have listened very well! You now need to clear everything off of your desk and line up at the door to take a bathroom break. The teacher will call the students to take a bathroom break to wash their hands. The students will go with Ms. Kreyenbuhl to the bathroom and then she will start her lesson when the students get back into the room.

Assessment Findings:

a. Data (raw data, narrative, chart, graph...)

Morning Class:

Student #	Score on array worksheet	Score on turkey worksheet
1	85	Homework
2	95	Homework
3	70	66
4	100	Homework
5	95	Homework
6	100	Homework
7	85	Homework
8	100	100
9	85	Homework
10	100	100
11	100	88
12	90	66
13	90	Homework
14	100	Homework

Afternoon Class:

Student #	Score on array worksheet	Score on turkey worksheet
1	B-100	Homework
2	Absent	Homework
3	A- 90	Homework
4	A-85	Homework
5	B-90	Homework
6	Homework	Homework
7	A- 80	Homework
8	B-95	Homework
9	A-85	92
10	B- 100	Homework
11	A- 90	Homework
12	A-95	Homework
13	A-100	Homework
14	B-90	Homework
15	B-90	Homework
16	A-90	Homework
17	A-100	Homework
18	A- 75	Homework
19	A-95	Homework

The students who have B in front of their name did the lower level worksheet. The students who have an A in front of their name did the higher level worksheet.

b. Patterns

The students who had the lower level differentiated worksheets did very well which meant it was the right worksheet for their level. They finished around the same time as the students who had the higher level worksheets. In the morning class many of the students were having difficulty with the array concept. However, with one on one practice they improved towards the bottom of their worksheet. Also their overall score showed that with the practice on the worksheet they understood the concept eventually. Another pattern that I noticed was that students either forgot to draw their array or they drew it sideways.

c. Analyzing

1. Overall I think that the lessons key knowledge and skills were met. They did struggle with the arrays but overall they understood the concept and how it can help them solve a missing factor problem. The key knowledge and skills for the multiplication chart was definitely mastered. The students have had very little practice using the multiplication chart; however, they love to use it and can use it correctly.

2. The students who had trouble with the concept were students # 6, 10, 17, and 19 for the afternoon class and students # 1, 3, and 7 for the morning class. There is a specific sequence of steps in creating an array and they had trouble remembering those steps. They also had trouble remembering what the columns and rows meant once they got their array finished.

3. The students who did well in the morning class were students # 4, 6, 8, 10, and 14. The students who did well in the afternoon class were students # 1, 3, 12, 13, and 17. All students had trouble with the lesson at first. However, after help from the teacher all students improved. These students improved the most and really understood the content by the end of the lesson.

d. Next step

For the students who had difficulty I would do more practice with them. I would give them a sheet that lists the steps to making an array that they could refer to. Also, I would give them another sheet that would have the steps on how to use the multiplication chart if needed.

The students who understood how to make an array but kept drawing it sideways would be pulled into a small group. In the small group we would review the arrays again with special focus on what the rows and columns mean.

Reflections:

a. During the planning process I thought about how I could save time. I presorted the amount of Smarties they would need to do the lesson and put them in a plastic bag with a paper towel. Students would just have to take them out of their individual bag and I would not have to worry about them trying to untwist the packet and the Smarties flying all over the floor. Also, I made two different worksheets for the two learning levels of students in the classroom. This made the lesson flow better because students were finishing up around the same time.

b. Next time I need to plan for more early finisher activities. The one I had this time almost was not challenging enough for the students. I think that having some books in the classroom about the topic we are learning will be better for early finishers to do.

c. During the teaching process I was more aware of students who would need help with the lesson. I made sure to check on them often and give support to them when needed. I also was more aware of students who talk and get distracted during the lesson. I was able to watch out for them talking and correct the behavior before it became out of hand. Also, while I was teaching the afternoon class we had a fire drill during the lesson. I was able to stop in the middle of teaching, get the students lined up and out of the building. When the fire drill was over I was able to get the students settled back into the classroom and back on task quickly.

d. Some of the things I can improve upon are not to be so apprehensive about giving out marks to the students who are acting inappropriately. Also, I need to have Mrs. Kreyenbuhl sit in the back of the classroom to be near the computer to help fix any technological issues that the Interwrite board might have. It causes too much of a distraction and disconnection to the content if I have to walk to the back of the classroom to fix it. If Mrs. Kreyenbuhl is there she can just reach over and click on the correct button. Until I can become more familiar with some of the quarks the board has I think this would be a good solution.

Level A and B Differentiated Worksheets

Level A:

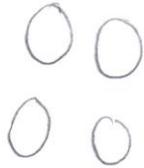
Name Brittany 13 10/14/08

100

A

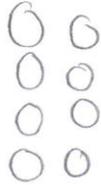
Directions: Solve the problem, DRAW the array. Write the number sentence

1. Ana made 2 equal stacks of paper cups. If he used 4 cups in all, how many cups did Ana put in each stack?



$$2 \times 2 = 4$$

2. If there are 4 candy bars in each box, how many boxes should Brain buy in order to get 8 total candy bars?



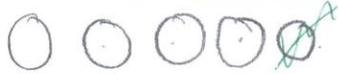
$$4 \times 2 = 8$$

3. At the grocery store, each box of frozen waffles contains 2 waffles. How many boxes should Logan buy to get 10 frozen waffles?

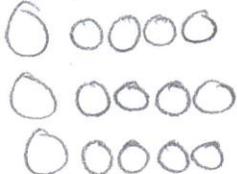


$$2 \times 5 = 10$$

4. There are 5 T-shirts in each package. Sydney needs 25 T-shirts for a class project. How many packages must Sydney buy?



$$5 \times 5 = 25$$



Level B:

Name naoeyel

100

B

Directions: Solve the problem, DRAW the array. Write the number sentence

- ✓ 1. Ana made 2 equal stacks of paper cups. If he used 4 cups in all, how many cups did Ana put in each stack?

$$2 \times 2 = 4$$



- ✓ 2. An airplane has 5 rows of seats. The plane can seat 20 passengers. How many seats are in each row?

$$5 \times 4 = 20$$



- ✓ 3. If there are 4 candy bars in each box, how many boxes should Brain buy in order to get 8 total candy bars?

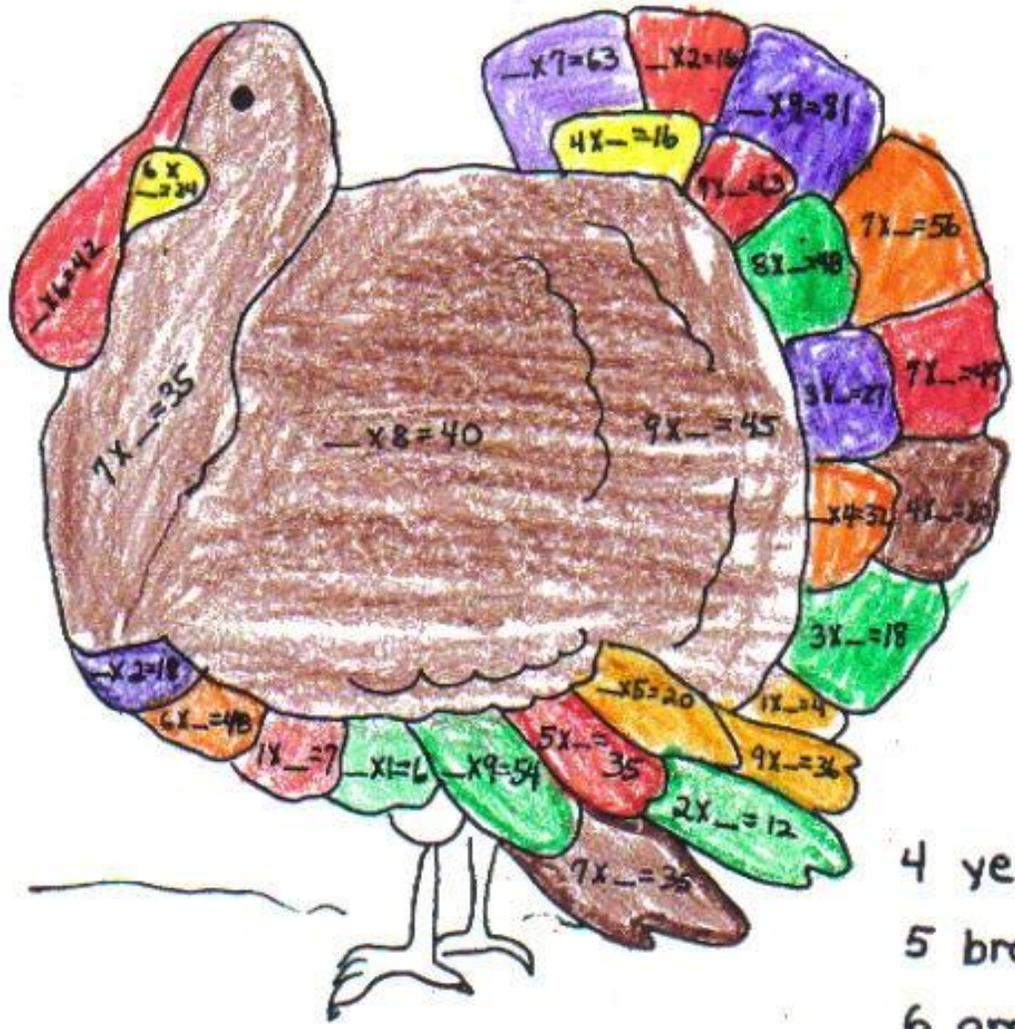
$$4 \times 2 = 8$$



100

Name: Maddy

DIRECTIONS: Find the missing factors. Color the regions using the missing factor code.



- 4 yellow
- 5 brown
- 6 green
- 7 red
- 8 orange
- 9 purple

Conclusion Activity

Students wear the cards and have to find their matching partner.

