

TASK 3: ASSESSMENT COMMENTARY

Respond to the prompts below (**no more than 12 single-spaced pages, including prompts**) by typing your responses within the brackets following each prompt. Do not delete or alter the prompts. Commentary pages exceeding the maximum will not be scored. Attach the assessment you used to evaluate student performance (**no more than 5 additional pages**) to the end of this file. If you submit a video or audio clip of feedback or a work sample and you or the focus students are occasionally inaudible, attach a transcription (**no more than 2 additional pages**) to the end of this file. These pages do not count toward your page total.

1. Analyzing Student Learning

- a. Identify the specific learning targets and standards measured by the assessment you chose for analysis.

[The assessment that I have chosen for analysis measures the learning targets from each of the three learning segments. The learning targets that are measured by the assessment are as listed:

- Interpreting products of whole numbers using repeated addition and groups.
- Interpreting products of whole numbers through arrays.
- Using multiplication within 100 to understand word problems in situations involving equal groups and arrays.

The standard that my chosen assessment measures is from Lesson 3, MATH.CONTENT.3.OA.A.3. Use multiplication within 100 to solve word problems in situations using equal groups and arrays.]

- b. Provide a graphic (table or chart) or narrative that summarizes student learning for your whole class. Be sure to summarize student learning for all evaluation criteria submitted in Task 3, Part D.

[The following table summarizes student learning for the whole class:

Student	Mathematical Conceptual Understanding (3 points)	Representation (3 points)	Neatness (3 points)	Total (9 points)
Advanced Student 1 (Focus Student 1)	3	3	3	9
Advanced Student 2	3	3	3	9
Advanced Student 3	3	3	3	9
Advanced Student 4	3	3	3	9
Advanced Student 5	3	3	3	9
Advanced Student 6	3	3	3	9
IEP Student 1	3	3	3	9
IEP Student 2	1	(no attempt)	1	2
Math Struggler 1	1	3	2	6
Math Struggler 2	3	3	3	9

Math Struggler 3 (Focus Student 3)	1	3	2	6
504 Student 1	1	3	3	7
Average Student 1 (Focus Student 2)	2	3	2	7
Average Student 2	3	3	2	8
Average Student 3	3	3	3	9
Average Student 4	0	0	3	3
Average Student 5	3	3	3	9
Average Student 6	3	3	3	9
Average Student 7	3	3	3	9
Average Student 8	3	3	3	9
Average Student 9	3	3	3	9
Average Student 10	3	3	3	9
Average Student 11	3	3	2	8
Average Student 12	3	3	3	9
Average Student 13	3	3	3	9
Total for each Criteria:	63/75	69/75	67/75	
Class Average Points Earned:				8

The student work was evaluated and based on their mathematical conceptual understanding, representation, and neatness, as identified on the evaluation criteria. Of the class, 84% of students scored well on mathematical conceptual understanding, 92% of students scored well on representation, and 89% of students scored well on neatness.]

- c. Provide a graphic (table or chart) or narrative that summarizes student understanding of their own learning progress (student voice).

[During the first lesson, students had little understanding of the concepts of multiplication and how equal groups and arrays could be used to represent multiplication sentences, as this was their first formal introduction to multiplication. I was able to recognize their understanding by eliciting student voice. For example, I asked students to tell me what they knew about multiplication during an activity called “Think, Pair, and Share”. During this exercise, they were able to tell me that multiplication had to do with addition, but were unable to provide me with an example or reasoning for their definition. One student even pointed out that by using

multiplication, you no longer would need to add, $9 + 9 + 9$, for example, but rather, you could multiply 9×3 .

After introducing students to equal groups during the first lesson, they practiced rolling dice to express multiplication sentences using equal groups. Most students understood that the first number they rolled represented the number of groups. However, many students were having trouble recognizing the role of the second roll. What students should have been doing was putting that number of dots in each of the previously drawn groups. Unfortunately, some students were trying to spread the number of the second roll through out the groups, not necessarily providing an equal number in each group. For example, one student rolled a 3 first. After drawing 3 circles to represent the 3 groups, the same student rolled a 6. Rather than placing 6 dots in each of their 3 circles, as they should have, the student put 2 dots in each group. After observing this, I got the attention of the class and did an example with them. I rolled a 4 the first time, drawing 4 circles on a page to show them. Next, I rolled a 3. I then went on to put three dots in each circle, explaining again to the class that the second roll is the amount of dots that go in each group. Later, I double-checked with the student mentioned earlier, to double check that she understood the second roll, which she did.

During the second lesson, students were using arrays to represent multiplication sentences. Overall, students seemed to demonstrate a deeper understanding of arrays than equal groups. An array was described to them as a picture of a multiplication sentence. The vocabulary words row and column were difficult for students to differentiate between. After realizing that they were struggling to remember which direction each word went, I tried to connect the words to experiences related to my students. I described a column by reminding students of the vertical list their spelling words are arranged in each week. This example resonated with a number of students. The horizontal direction of a row was described to the students in the way that movie theatre seats are arranged. These visual reminders helped students differentiate between rows and columns when creating an array.

As we progressed through the third lesson, students struggled to understand how multiplication related to story problems and real life scenarios. As a class, using personal whiteboards at their tables, students worked through multiple real life scenarios with me. I wrote a problem relating to the learning target on the board. After allowing students adequate time to solve it on their own, I worked through it on the large, classroom whiteboard. In an effort to keep the students engaged, I worked through it based on their responses. For example, I began by asking students, "What is the first thing I should do?" This kept students engaged, as well as gave them the opportunity to verbally explain their understanding of the mathematical concepts. The problems encouraged students to use arrays and equal groups to interpret multiplication sentences. At the end of the lesson, after looking at student scores, I realized that there are still students who will need additional guidance and practice understanding the concepts.]

- d. Use evidence found in the **3 student work samples, student self-reflections, and the whole class summary** to analyze the patterns of learning **for the whole class** and differences for groups or individual learners relative to
- conceptual understanding
 - procedural fluency **AND**
 - mathematical reasoning or problem-solving skills

Consider what students understand and do well, and where they continue to struggle (e.g., common errors, confusions, need for greater challenge).

[Evidence of feedback is written on the student work samples, submitted in Task 3A. In analyzing the three student work samples, student self-reflections, and the whole class

summary I was able to identify what student's understood as well as where they continued to struggle throughout the learning segment. The majority of students were comfortable with interpreting products of whole numbers using arrays and equal groups. However, most students struggled to apply those same multiplication strategies to story problems and real life scenarios.

From reviewing the whole class completed assessments, I can clearly recognize which students developed a conceptual understanding of multiplication strategies. As students progressed through the unit, their conceptual understanding grew as they developed an understanding of why the concept of multiplication is important and the context in which it is useful. Students who demonstrated a conceptual understanding were able to organize their knowledge in a way that allowed them to learn new multiplication concepts by connecting them to the concepts and ideas they had already learned from the previous learning segments. In looking for evidence of student's conceptual understanding I looked in both student's performance as well as their ability to verbalize connections among multiplication concepts. In many cases students struggled to verbalize the connections but could demonstrate conceptual understanding through modeling their ideas during specific tasks and assignments. For example, during Lesson 2 students used their white boards to demonstrate their understanding of using arrays to represent multiplication sentences (as seen in video clip 1). This activity quickly and effectively revealed students conceptual understanding through a combination of written and oral responses. Overall, students demonstrated conceptual understanding by drawing an array that correctly modeled the corresponding multiplication sentence.

In analyzing the whole class performance I can identify areas of strength as well as areas where student's need work in further developing their procedural fluency. In the first two lesson segments students were on-target, knowing when and how to apply knowledge and procedures accurately in class discussions and assignments. Throughout the learning activities students demonstrated their procedural fluency by actively participating in class discussions and thinking flexibly and efficiently throughout the learning segment. For example, when I presented students with a question stating, "If there is a book shelf with 7 shelves and 4 books on each shelf, how many books are there total?" they were able to recognize that different methods and strategies could be used to solve the problem. Some students found it easier to use equal groups and others found it easier to use an array to describe the problem and ultimately solve it. In specifically analyzing students with an IEP, there were times during instruction where they struggled to use procedures efficiently because they applied the knowledge they learned without developing conceptual understanding. To promote procedural fluency for struggling students I provided opportunities during instruction where I modeled multiple strategies for solving and comparing multiplication sentences. In addition, I established connections between new concepts to previously learned knowledge throughout my instruction. In looking at the three student work samples, I was able to recognize the different problem solving skills they used throughout the assessment. For example, by presenting students with a problem solving opportunity in the assessment, students were allowed to combine the new knowledge of multiplication strategies with the previous knowledge of multiplication strategies that they had developed. This was a problem a number of students were successful with.]

2. Feedback to Guide Further Learning

Refer to specific evidence of submitted feedback to support your explanations.

- a. In what form did you submit your evidence of feedback for the 3 focus students? (**Delete choices that do not apply.**)
 - Written directly on work samples or in a separate document;
- b. Describe what you did to help each student understand his/her performance on the assessment.

[To help students understand his/her performance on the assessment I wrote the number of points they got correct over the points possible. This provides each student with evidence of his/her overall performance of achieving the learning target. In addition, I provided students with both positive and directive feedback to guide their future learning.

To help students understand his/her overall performance I provided him/her with specific corrective feedback. This helped students understand what questions they got wrong and why. My purpose in giving specific directive feedback, as opposed to just marking it wrong, was to help each student understand his/her performance and how he or she could improve future learning. In writing feedback it helped students understand the expectations for each problem so that they could visually see how they answered the question incorrectly. In addition, written feedback provides students with constructive responses that help improve their performance in the future. I also provided students with positive feedback that would show them areas of the assessment that they did exceptionally well on. In writing feedback, I found opportunities to encourage students when they shared an intuitive explanation or representation of a multiplication strategy. When students answered questions incorrectly, I gave them specific reminders or guidance to help them understand their performance. Sometimes even writing just a question to help them see where they went wrong. By providing students with both positive and corrective feedback on their returned assessments in a timely manner, it gives them the opportunity to use the feedback as a tool to guide their continued learning.

On Student 1's work sample, the student shows a deep understanding of the learning target. Student 1 successfully described an array using the words we had reviewed multiple times during carpet time. This showed that Student 1 was engaged in the learning process. When constructing their own array, Student 1 neatly drew dots to correctly represent an array. The only corrective feedback I added was, "In the future, you could lessen the gap so there is no question that is one array". This feedback reminds Student 1 that an array should appear as one group. On the second page, Student 1 demonstrates a deep understanding of how repeated addition relates to multiplication as well as an array. The feedback I provided for that question is as follows, "Excellent! This shows me that you understand repeated addition as well as arrays. You also followed the directions by using words and a picture in your answer". After reading through Student 1's successful assessment, I was surprised to see how they rated their understanding of the learning target. Student 1 gave themselves a 6/10 on understanding how to use arrays to represent multiplication sentences and a 9/10 on using equal groups. In my feedback I provided the student with an opportunity to strengthen their understanding by saying, "You seem to have a good understanding of arrays. I would be happy to meet and discuss how we can build your confidence with the multiplication strategies".

On Student 2's work sample, the student shows a general understanding of the learning target. When asked to describe what an array is, Student 2 was able to connect the vocabulary words row and column to the concept of an array. However, I was looking for the additional description, "a picture of a multiplication sentence". This would have shown me that Student 2 was engaged during carpet time, where we reviewed that description a number of times. When asked to write the multiplication sentence that represented the story problem, Student 2 wrote both "2x4" and "4x2". This demonstrated the student's understanding of the commutative property of multiplication, a concept we have not discussed in class yet. My assumption would be that they carried that knowledge over from the commutative property of addition, which is an impressive connection. My feedback to Student 2 on that problem is as follows, "Awesome job constructing a multiplication sentence to represent the story problem! By showing me that you understand that 4x2 and 2x4 gives you the same answer you are ready to learn more about multiplication!" On the second page, Student 2 correctly explained how to solve 3x5 without knowing their multiplication facts. By using repeated addition, this student is showing an understanding of the learning target. However, Student 2 lacked to follow the directions that indicated to use words and pictures to explain their understanding.

On Student 3's work sample, the student shows a general understanding of the learning target. When Student 3 was given the assessment, they immediately raised their hand and expressed to me, "I don't get this". I drew the conclusion that Student 3 was overwhelmed with the amount of reading. I sat down with this student and verbalized each question for Student 3. This is not part of the student's IEP plan, however I was comfortable doing it, because I was assessing their mathematical understanding of the concepts, rather than their spelling or writing abilities. When asked to describe what an array is, they were able to connect the vocabulary words row and column to an array however, I was looking for the phrase "a picture of a multiplication sentence" to assess how engaged they were during carpet time, where we reviewed that phrase several times. On the second page, when asked how they would solve 3×5 if they did not know their multiplication facts, Student 3 was able to draw an array and again mention using rows and columns. However, in my feedback I said the following, "An array is a great way to find the answer! But how would you find the answer with the help of an array?" By ending the feedback with a question, I was hoping to elicit a deeper thought process for the student. Overall, I think that the student has a general understanding of the learning target, however I think reviewing the concepts a little more would benefit Student 3 greatly.]

- c. Explain how feedback provided to the 3 focus students addresses their individual strengths and needs relative to the learning targets measured.

[The evaluation criteria that measures the learning targets focuses on student's mathematical concept understanding, representation abilities, and overall neatness. To all three of my focus students I gave specific feedback that highlighted their strengths and well as identified areas that the student needed to improve. In looking at each assessment, I recognized patterns in areas where students continued to struggle or succeed. This allowed me to write specific feedback that helped students understand areas they needed to review. By providing students with direct and gentle feedback, I maintained their self-worth while directing their attention to areas that needed improvement. In encouraging student growth towards understanding multiplication strategies I did not always provide them with the correct answers so they could go back and correct their work. In looking at students overall performance I can use their scores to determine which learning targets need to be reviewed to further develop students' understanding of multiplication. I can also use their performance as a guide to plan additional lessons on these topics. By reviewing their assessments before further instruction on the topic of multiplication I can ensure that I review the areas of struggle, clarify misconceptions, and provide students with necessary supports to promote their learning.

On Student 3's work sample, I included a question in the specific feedback I left for them. This was done to help them recognize the errors they had made, without providing them with the answer in order to foster future learning. Student 1 is highly achieving, however their self-reflection didn't reflect this. In Student 1's self-reflection feedback I included an opportunity to gain confidence in their mathematical abilities. Student 2 showed an understanding of the concepts however didn't fully follow the directions on the question asking for both words and pictures to explain their thought process. Overall, the feedback for the 3 focus students was written to address their individual strengths and needs relative to the learning targets measured.]

- d. How will you support students to apply the feedback to guide improvement, either within the learning segment or at a later time?

[After returning the assessments to students, I plan to have a class period designated to working through the assessment, explicitly going over the areas where students struggled. Next, I will have students work through the assessment with a partner and discuss their reasoning for answering each question. To encourage student growth in learning multiplication strategies students will be grouped with a partner that succeeded in different areas than themselves.

Students will be encouraged to work together and explain their mathematical reasoning and problem solving strategies. The class will be informed that the scores on the assessment proved us with feedback that gives us the opportunity to guide our future learning. This will also allow students to re-teach each other the concepts they didn't fully understand throughout the learning segment. In addition, I will ask students to listen carefully to their partner's mathematical reasoning and problem solving skills. Even if students know the correct answer they will be encouraged to be respectful and attentive to their partner's response because it will give them the opportunity to deepen and further their understanding of multiplication. Overall, by having students reflect on their assessment with a peer it gives them opportunities to share their mathematical reasoning and problem solving skills used in answering each question. Student discussions will promote further engagement in learning as well as encouragement and guidance from peers in areas where each individual student struggled. After students discuss their mathematical reasoning used to answer questions they will be provided an opportunity to individually correct their assessment by writing new answers on a separate sheet of paper. Students will be asked to justify these new answers by explaining their reasoning for the answer being correct and attaching their corrections to the assessment to hand in to me again.

In re-analyzing students corrected assessments, I am aware that they will still need further guidance or reinforcement in some areas. In planning future learning, I will continue to engage students in enhancing their knowledge and understanding of multiplication. I want to give students more opportunities to practice implementing mathematical reasoning and problem solving skills by solving and interpreting multiplication strategies. It is my goal to provide students with engaging activities that stimulate their thinking and promote growth towards deepening their understanding and knowledge of concepts or multiplication. In recognizing students struggle with understanding how different strategies can be used to represent multiplication sentences, I plan to re-teach these strategies and provide students with opportunities to engage in tasks and activities that promote their learning towards better understanding of the strategies and concept of multiplication. Overall, I especially want to plan future learning tasks that build on student's prior knowledge in a way that teaches them to analyze and interpret more complex multiplication concepts.]

3. Evidence of Language Understanding and Use

You may provide evidence of students' language use **from ONE, TWO, OR ALL THREE of the following sources:**

1. Use video clip(s) from Task 2 and provide time-stamp references for language use.
2. Submit an additional video file named "Language Use" of no more than 5 minutes in length and provide time-stamp references for student language use (this can be footage of one or more students' language use). Submit the clip in Task 3, Part B.
3. Use the student work samples analyzed in Task 3 and cite language use.

When responding to the prompt below, use concrete examples from the video clip(s) (using time-stamp references) and/or student work samples as evidence. Evidence from the clip(s) may focus on one or more students.

- a. Explain and provide evidence for the extent to which your students were able to use or struggled to use language (selected function, vocabulary, and additional identified language demands from Task 1) to develop content understandings.

[During my learning segment, students were given several opportunities to use my selected language function, modeling. During each lesson, students were learning new multiplication

strategies to be used to model multiplication sentences. During Lesson 1, students used dice to model the multiplication strategy of equal groups and repeated addition. During Lesson 2, students used dots, stars, hearts, or x's to model the multiplication strategy of arrays. During Lesson 3, students given story problems and asked to use a multiplication strategy to model the problem with. This activity gave the students a chance to demonstrate their cognitive understanding of the strategies and how to apply them in different situations.

In the additional video file named "Language Use", my students demonstrate the extent to which they understood or struggled to understand the language related to the lesson (vocabulary words). In the video, I demonstrate how to model arrays during the introduction of Lesson 2. This is called "carpet time" (which has been referred to throughout this commentary) and occurs at the beginning and end of each of my lessons. This time is beneficial to both the students and I. It was a time that showed me that students understood how to model the concepts using arrays and equal groups. As for the students, it was beneficial to them because it gave them a chance to clarify and review concepts.

During the Language Use video at 2:15, I introduced that an array is a picture of a multiplication sentence. This was the response I was looking for on the chosen assessment that my 2 of my 3 focus students did not successfully recall. At 2:40 in the Language Use video, we are reviewing the concept of equal groups. During 3:18-3:46 of the Language Use video I described which number of a multiplication sentence represents the number of rows and which number represents the number of columns, relating to an array. Row and column were 2 of the vocabulary words of Lesson 2. I modeled the creation of an array from the multiplication sentence on the anchor chart, 3×5 . At 4:32 in the Language Use video, in order to help students distinguish between the vocabulary words, row and column, I asked students to model the directions using their hands, vertically for columns, and horizontally for rows. Throughout this video, the students were engaged in conversation relating to modeling the multiplication sentence 3×5 to develop content understandings.]

4. Using Assessment to Inform Instruction

- a. Based on your analysis of student learning presented in prompts 1b–d, describe next steps for instruction to impact student learning
 - for the whole class
 - for the 3 focus students and other individuals/groups with specific needs

Consider the variety of learners in your class who may require different strategies/support (e.g., students with IEPs or 504 plans, English language learners, struggling readers, underperforming students or those with gaps in academic knowledge, and/or gifted students needing greater support or challenge).

[For the whole class, I definitely want to continue to teach and reinforce the concept of understanding how to use the different multiplication strategies. Overall, because this learning segment was the first time student's were formally introduced to multiplication, the need further instruction and guidance in helping them develop a conceptual understanding of the learning targets from this unit. In future lessons, I plan to incorporate opportunities for students to build connection to multiplication concepts and apply them in their everyday life experiences. By giving students these opportunities it will set a positive purpose for learning. My goal in teaching mathematics is to provide students with enriching lessons that help them recognize the usefulness and importance of understanding multiplication in their everyday lives. From looking at my student's assessments, I could tell that three lessons were not enough to have students reach a mastery level of understanding multiplication. As a group, this class is below grade level in regards to both reading and mathematics, so it will take extra instruction and continued practice to really help students feel comfortable with achieving the learning targets from this

unit. Specifically, I want to work through examples that ask students to recognize and interpret multiplication strategies. For example, I will write a multiplication sentence on the board, $4 \times 5 = 20$. I will then ask them to model equal groups, repeated addition sentence, and an array that correctly represents the multiplication sentence. For my IEP and 504 learners (Note: there are no ELL category students in this learning segment) I will provide them with visualizations and hands on activities to help them explore the concept. I will provide students with continued practice in the form of both written and oral practice, to ensure they have multiple opportunities to elicit student voice.

For the 3 focus students, I will give them opportunities that fit their individual learning needs. For example, Student 2 is an average learner that needs continued practice and guidance to help them understand the concepts covered in this unit. In knowing this student's mathematical capabilities I feel that they will excel quickly as they are provided with more opportunities to elicit their understanding. In addition, by providing this student with corrective feedback on their assessment, they will be able to visualize the errors they have made and make corrections to their work. Student 3 however, is a low achieving student, though technically is not classified within an IEP category. In looking at the student's self-reflection I was surprised at how they scored their understanding of each learning target as having a deep understanding (ranking themselves between 8-10 on the self-reflection questions). However, in knowing this student, I believe they felt they had succeeded at these lessons because they enjoyed the lesson content and activities. Although, in comparing this student's previous mathematics scores to the scores they received in this learning segment, they were excelled. Due to this student's improvement in understanding mathematics, I can see how they feel they deserve an 8-10 in interpreting their performance, even though their results of their assessment don't necessarily reflect this. In looking at Student 1's work samples I recognize that this student should be provided with additional resources to promote continued learning of multiplication. This student scored perfect on the assessment. In saying this, I plan to provide this student with activities and assignments that challenge them to further develop their conceptual understanding and procedural fluency of multiplication strategies. In addition, because this student learns at a faster pace in comparison to their peers, I plan to provide extra examples when working one-on-one with this student. Overall, by allowing all 3 of my focus students to re-evaluate and correct their assessments it gives them the opportunity to reflect and improve their learning. By asking students to make these corrections it requires them to re-think and develop stronger conceptual understandings and procedural fluency towards understanding these concepts. For struggling readers, IEP, and 504 students who struggled grasping the concepts or vocabulary in these lesson segments I plan on providing them with additional tools to help them further their learning. In planning further instruction I will provide students with extended learning tasks that scaffold by building on simple tasks and concepts. By monitoring student learning and having them work from simple tasks to more complex tasks, it will provide them with the necessary skills and confidence to further their learning on the topic of multiplication.

For students who excel at understanding and applying the lesson content I will structure lesson activities in a way that supports and challenges their learning. In planning, instructing, and assessing my future lessons on multiplication I will plan to provide additional tasks and sample problems during instruction to challenge these students learning. If students finish the assigned task before the rest of the class I will have an engaging activity or task that furthers their learning on the concept of multiplication; this could be in the form of an assignment, hands-on activity such as creating a physical array out of manipulatives, multiplication game, etc.

In summary, the whole class needs more guided practice and opportunities to explore the multiplication strategies of equal groups, repeated addition, and arrays. In knowing that these lessons were the first formal introduction of multiplication for students, I am aware that students need more opportunities to learn and explore these strategies and concepts before they are able to achieve a mastery level of understanding.]

- b. Explain how these next steps follow from your analysis of student learning and student self-reflections. Support your explanation with principles from research and/or theory.

[I was able to develop next steps in planning, instructing, and assessing students for my analysis of student learning and their self-reflections. From analyzing students overall performance I concluded that students still need more exposure to the concept of multiplication, especially since this was the first time they were exposed to the concepts. Students need more opportunities to practice identifying, interpreting, and modeling multiplication strategies. Thus, the reasons I used the steps I expressed above in future instruction over these multiplication strategies. In following the same lesson format of the lessons taught in the lesson segment, I plan on continuing to use Burns (2007) lesson format of developing a lesson into three parts; introduce, explore, and summarize. I find this lesson format to build on student learning. By focusing your learning segment in three tasks it provides you with the opportunity to use both informal and formal assessments to check for student understanding. Before moving on to the next step in future lessons I plan on asking questions that allow students to elicit their voice by asking students directly if they feel prepared to move on to the next task. This will provide students with the opportunity to elicit their voice orally and ask for any clarifications on any misunderstanding or areas of confusion.

In following Bruner's theory of discovery learning and scaffolding, I plan to provide learning supports that interest students while building their conceptual understanding of multiplication. Overall, both of Bruner's theories support my desire to continue to engage students in tasks that build on simple multiplication knowledge to more complex knowledge. In continuing to plan lessons on multiplication strategies I will continue to promote exploration of multiplication by following Bruner's concept of discovery learning (1960). In my previous lessons I promoting discovery learning, by allowing students to use dice to model equal groups, creating arrays of objects, and using their whiteboards to use the recently learned multiplication strategies to solve story problems. In reflecting on my previous learning activities I plan to continue to incorporate interactive tasks that engage students and require them to apply their knowledge and understanding of multiplication. Through scaffolding instruction and consistently connecting the concepts of multiplication when introducing new concepts, students will work towards becoming independent mathematicians who can identify, interpret, and model multiplication concepts with confidence and efficiency.

In analyzing student's self-reflections I was able to identify that they lacked understanding over the strategies of multiplication, specifically equal groups and arrays. Overall, students enjoyed the learning tasks and activities in this multiplication unit. In knowing students interests and learning styles, I was able to successfully plan learning segments that engage them in developing knowledge and understanding of the concepts of multiplication. In looking at student's responses from the assessment I can see that they really enjoyed the second lesson, learning about arrays. Out of my 3 focus students, they all used an array as the multiplication strategy to solve 3×5 on the assessment. The lesson on arrays not only promoted students engagement in the task, but also excited their interest in recognizing arrays in the world around them.]

Name _____

Multiplication

Using words, please describe what an array is.

Create an array using the following multiplication sentence. You may draw whatever object you like (dots, x's, hearts, etc).

$$4 \times 7 = 28$$

If I have 2 kittens and each kitten has 4 paws, how many paws do I have total? Write the multiplication sentence with your answer.

Explain how you might solve 3×5 if you did not know your multiplication facts. Use words and pictures in your answer.

On a scale from 1-10, circle your understanding of the following, 10 being a good understanding and 1 being a poor understanding.

How comfortable do you feel using arrays to represent multiplication sentences?

1 2 3 4 5 6 7 8 9 10

How comfortable do you feel using equal groups to represent multiplication sentences?

1 2 3 4 5 6 7 8 9 10