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Content Specific Math Instruction To Improve English Language Learners' Comprehension Of Comparison Math Word Problems

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CONTENT SPECIFIC MATH VOCABULARY INSTRUCTION TO IMPROVE ENGLISH LANGUAGE LEARNERS COMPREHENSION OF COMPARISON MATH WORD PROBLEMS

By

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CAPSTONE PROJECT OVERVIEW

Research Question and Project Description

This capstone research project is developed around the research question, *how can math instruction and comprehension of comparison word problems for ELL students be enhanced through content specific vocabulary on "many," "more," and "fewer," and combinations of these words?* The goal of this project is to develop a vocabulary unit to benefit ELLs' ability to comprehend and solve comparison word problems.

I developed a ten day unit of vocabulary lessons focused on these words; many, fewer, more, and combinations of these words, many more and many fewer. The vocabulary strategies used in these lessons came from the research in my literature review. I chose to focus the vocabulary on these three words and combinations of these words because in my past teaching experiences first grade students were inconsistent with solving word problems when these vocabulary words showed up in comparison word problems.

This ten day unit starts with a pre-assessment of students' ability to solve different types of word problems including comparison word problems that use the vocabulary many, fewer, more, many more and many fewer. The post assessment is an assessment of comparison word problems similar to the pre-assessment but has the added question of having students write their own word problems. During the eight instructional days students will be using a variety of strategies that focus on their understanding of the vocabulary words. These strategies include: defining and writing the vocabulary words (Ediger, 2008), sentence frames (Barrow, 2014), gestures (Barrow, 2014), vocabulary journals (Barrow, 2014 & King, 2016), real objects and demonstrations (King, 2016), acting it out (King, 2016), and drawing (King, 2016).

Audience

This ten day unit of vocabulary lessons is intended for first grade classroom teachers that are using Math Expressions curriculum. The vocabulary unit should be taught alongside chapter six in Math Expressions; this chapter goes over reading and comparing picture graphs, creating graphs, addition and subtraction word problems, comparison word problems, measuring and patterning. While my research question mentioned specifically ELL students, these vocabulary lessons are able to support all first grade students.

Format

When designing this project I used the Understanding by Design (UbD) approach from Wiggins & McTighe (2008). I had previous experience creating unit plans with UbD and used the same template with this vocabulary unit. I started planning by first looking at the state standards and what desired results I wanted students to have at the end of the unit. You will see in my curriculum unit that my desired results included having students understand comparison and be able to compare to items whether in a word problem or found in a graph. It is important when using the UbD methodology in curriculum planning that you understand what you want students to be able to do and understand before you develop individual lessons and products. After developing my desired results I next looked at different forms of assessment and how I would interpret evidence of students' understandings of my desired results. For this unit I am choosing to use a pre-assessment and post-assessment using the vocabulary used in comparison word problems. The final process with using Wiggins & McTighe (2008) approach with UbD for this unit was creating the lessons and appendices. When developing the activities in each lesson I used a checklist of strategies from my literature review. This allowed me to ensure I was using a variety of researched strategies throughout the unit plan.

Additional Information

This project is intended to be used with first grade students and teachers that implement the Math Expressions curriculum. This unit could be taught in isolation from Math Expressions and also utilized with units that involve measurement or other forms of comparisons. The appendices at the end of this unit layout how the student journal and day to day lessons should be utilized. When teaching this unit it is important to remember the importance of vocabulary. While I want students to be able to solve comparison word problems the focus of this unit is for students to first understand the vocabulary used to understand word problems and other forms of comparison.

Math Content Vocabulary Lessons

Content: Math Vocabulary
Unit Title: Comparison Word Problems Vocabulary
Grade Level: 1
Quarter: 3 (January/February)

Unit Summary: In this Unit, first grade students will be learning the meaning of the vocabulary words, many, fewer, more and combinations of these words. This will support first grade students comprehension of comparison word problems.

Stage 1: Desired Results

Established Goals/Standards

Math

Strand	Standard	No.	Benchmark
Algebra	Use number sentences involving addition and subtraction basic facts to represent and solve real-world and mathematical problems; create real-world situations corresponding to number sentences.	1.2.2.1	Represent real-world situations involving addition and subtraction basic facts, using objects and number sentences. *For example: One way to represent the number of toys that a child has left after giving away 4 of 6 toys is to begin with a stack of 6 connecting cubes and then break off 4 cubes.*

Adapted from "2007 Minnesota K-12 Academic Standards in Mathematics by Progressions with Benchmark-item Difficulty," by the Minnesota Department of Education, 2015, *Division of Academic Standards and Instructional Effectiveness* p. 18.

Transfer of Learning	***Students will be able to independently use their learning to*** solve addition and subtraction word problems that use the words many, more, fewer and combinations of these words.

Making Meaning	**UNDERSTANDINGS** ***Students will understand that…*** Depending on the combination of the words more, fewer and many students will need basic addition and subtraction skills.	**ESSENTIAL QUESTIONS** ***Students will keep considering…*** If their answer makes sense when solving comparison word problems.

Acquisition of Learning	***Students will know…*****Students will need to know the following in order to… (e.g. facts, concepts, generalizations, rules, theories, principles)** ● How to do basic addition and subtraction. ● Practice with word problems. ● Understanding of the word comparison. ● Understanding of the word specific. ● How to solve and create equations. ● Basic understanding of picture graphs.	***Students will be skilled at…*****(Students will be able to DO.. skills, procedures, processes** ● Adding ● Subtracting ● Comparing two items ● Understanding the different meanings of more, many and fewer depending on the combination of words.

Stage 2: Assessment Evidence

Desired Results	Assessment
Transfer	***PERFORMANCE TASK(S) Using G.R.A.S.P.S.:*** Indicates student's ability to independently transfer understanding to a new situation or context, which is the main goal of the unit and indicates progress toward benchmarks. The learning events within the unit should equip students with the necessary knowledge and skills to complete these tasks. **G-Goal** What should students: Students should be able to understand the vocabulary words more, fewer and many so they are able to solve real world comparison

<table>
<tr><td></td><td>
<table>
<tr><td>accomplish by completing this task?</td><td>problems that use the vocabulary many more and many fewer.</td></tr>
<tr><td>R-Role
What role (perspective) will your students be taking?</td><td>Students will be taking on the role of being problem solvers and have the ability to understand data in problems that show comparisons.</td></tr>
<tr><td>A-Audience
Who is the relevant audience?</td><td>Audience for this task can vary based on the word problem. At times students will be comparing data for their classroom, for the lunch count, the zoo etc.</td></tr>
<tr><td>S-Situation
The context or challenge provided to the student.</td><td>Students will need to be able to understand how combination or the vocabulary words that they have learned can change in meaning when grouped together and also can change the equation you create to solve.</td></tr>
<tr><td>P-Product, Performance
What product/performance will the student create?</td><td>At the end students should not only be able to solve comparison word problems but also write comparison word problems, look at data and compare it across curricular areas.</td></tr>
<tr><td>S-Student
Directions
How will you present the take to the students?</td><td>When learning about this vocabulary it will help students to be better prepared to understand comparison problems.</td></tr>
</table>
</td></tr>
<tr><td>Meaning and Acquisition</td><td><u>OTHER ASSESSMENT EVIDENCE:</u> Indicates assessment of knowledge, skills, standards and other goals that are not otherwise assessed by the performance task.

● Students will be able to write their own comparative word problems.
● Students will be able to answer comparative questions when looking at a graph.
● Students will be able to compare items when measuring.</td></tr>
</table>

Stage 3: Learning Events

Pre-Assessment: Students will complete a pre-assessment, see appendix B.

Lesson	Lesson Activity	Materials Needed
1	**Students will take a four question pre-assessment:** ● Read all four questions aloud to students. ● Have students go back to their work space, read each question slowly three times while students try their best to solve. ● Allow students to work at their own pace, reread questions to students as needed.	Pre-Assessment (Appendix B)
2	**Learning Target:** I can identify how ***many*** objects there are with a specific number. **Define the word many:** ● Write the word **many** on the board. Show 2 different examples of the word many used in a sentence. ○ *How **many** students are in our class?* ○ *There were **many** people at the movie theatre last night.* ● Explain that in the first sentence ***many*** is used in a question, to answer the question you would use a specific number. Ask the students, *how **many** students are in our class? (When stating the question gesture by tilting your head and putting your arms up, showing you are asking a question).* Explain that the second sentence is using the word ***many*** to mean 'a lot' or 'a big amount'. Explain that in math we are going to be using the meaning of ***many*** to answer a question with a specific number. **Journal:** ● Have students get out their math journal. Have them write the word ***many*** with a short definition. ○ ***Many**: an answer to a question with a specific number.* ● Give students a picture with ducks to glue in their notebook and have students answer the question, *how **many?***	Example Problem (Appendix D) Sentence frame (Appendix G) Student Math Journal Example (Appendix E) Vocab Cards & Definition (Appendix F)

	(appendix D) ● Give students the sentence frame ○ *How **many** _____ are on the page?* _____ (Appendix G) ● Have students draw and fill out the sentence with their own picture and number in their math journal. *Appendix E is an example of what the student journal should look like. **Close:** ● End the lesson by placing the ***many*** card and definition on the math word wall and explain again that many is the answer to a question with a specific number. (Appendix F) Have students practice the gesture to go with the word many.	
3	**Learning Targets:** I can solve math problems with the word ***more***. **Define the word more:** ● Write the word ***more*** on the board. Ask students what the word ***more*** means. (Have 2 or 3 students respond). ● Explain that ***more*** means that there is a 'greater' or 'bigger' amount or number of something. ● Show the following sentence. ○ *6 is **more** than 2.* ● Ask students to give examples of numbers that are ***more*** than 5 (student response), 13 (student response), 17 (student response), 59 (student response). ● Say that those examples of numbers were bigger or greater. ● Ask students what we can do to get a bigger number. (Guide them to suggest adding if no students answer with adding). ● Give an example on the board of using ***more*** to add. ○ *I have 3 pencils (hold up 3 pencils), Sara gives me 2 **more** pencils. (Have a student give 2 pencils). How many pencils do I have now? 3+2=5* ○ Explain that by adding 2 ***more*** we got a bigger or greater amount. **Journal with real objects:** ● Have students get their math vocabulary journals. Have	Student Math Journals (Example Appendix E) Stickers

	them write the word ***more*** with a short definition. ○ ***More:*** *a bigger or greater amount or adding on to get a bigger or greater amount.* ● Give each student 6 stickers, have them place them in the journal and write *I have 6 stickers.* Give students 3 ***more*** stickers. Have students write, *Ms./Mr./Mrs. _____ gave me 3* ***more*** stickers. Ask students how many stickers they have now? Write an equation to go with the stickers. *6+3=9* ● Explain that we added 3 ***more*** stickers to get the greater or bigger amount of 9. ● Make sure students understand that 3 more does not mean that 3 is more than 6. *Appendix E is an example of what the student journal should look like. **Close:** ● End the lesson by placing the ***more*** card and definition on the math word wall and explain again that more is a bigger or greater amount. (Appendix F)	
4	**Learning Target:** I can solve math problems with the word ***fewer****.* **Define the word more:** ● Write the word ***fewer*** on the board. Ask students what the word ***fewer*** means. (Have 2 or 3 students respond). ● Explain that ***fewer*** means that there is a 'less' or 'smaller' amount or number of something. ● Write the sentence following sentence. ○ *5 is* ***fewer*** *than 8*. ● Ask students to give examples of numbers that are ***fewer*** than 4 (student response), 12 (student response), 37 (student response, 69 (student response). ● Say that those examples were of numbers that were smaller or less. ● Ask students what we can do to get a smaller number. (Guide them to suggest subtracting). ● Give an example on the board showing how to use ***fewer*** to subtract. ○ *I have 6 pencils (hold up 6 pencils), Marco has 2* ***fewer*** *pencils. (Ask students how should we find out how many pencils Marco should have?). How many pencils does Marco have? 6 - 2 = 4*	Student Math Journals (Example Appendix E) Stickers

	Journal with real objects: ● Have students get their math vocabulary journals. Have students write the word ***fewer*** with a short definition. ○ ***Fewer:*** *a smaller or less amount.* ● Give each student 9 popsicle sticks, have them place them in the journal and write, *I have 9 popsicle sticks. Then say, Ms./Mr/Mrs. _____ has 4 fewer popsicles sticks. Ask students how many popsicle sticks Ms./Mr/Mrs. _____ has?* ● Explain that we subtracted 4 popsicle sticks to get a fewer amount. Make sure they understand 4 fewer popsicles sticks doesn't just mean that 4 is fewer than 9 but that we needed to take 4 away to show 4 fewer. *Appendix E is an example of what the student journal should look like. **Close:** ● End with placing the ***fewer*** card and definition on the math word wall and explain again that fewer is a smaller of less amount.	
5	**Learning Target:** I can solve math problems by drawing a picture. **Go Over Vocabulary:** ● Explain that today we are going to solve math problems with pictures. Go over the vocabulary words and definitions on the math word wall, ***many, more*** and ***fewer***. **Drawing:** ● Share that today we will be drawing pictures to help solve word problems so we can tell how many crayons we have. Tell students that the pictures we draw today will help when you compare 2 things. ● *Say: "Emma has 7 crayons" (write Emma and 7 lines after Emma's name across the board). Then, say: "Nico has 4 more crayons then Emma (write Nico's name under Emma's). Say: "Nico has 4 more crayons then Emma, hmmmm what does this mean? More means that it is a greater amount, so Nico needs to have a greater amount of crayons then Emma. Nico needs to have 4 more crayons then Emma and Emma has 7 crayons. I am going to draw 7 crayons that Emma has next to Nico's name and then 4 more" (draw 7 lines after Nico's name and then add 4 more lines).*	Student Math Journals (Example Appendix E)

	● Explain that the picture shows Nico having a greater amount or more crayons than Emma. Ask: *How many (gesture with hands up and head tilted to show this is the question) crayons does Nico have?* (Count the crayons aloud with students). *Nico has 11 crayons.* **Journal:** ● Walk through a similar problem but this time have the students draw with you as you teach. ● *Say: "Jill has 2 crayons" (have students with you write Jill and draw Jill's 2 crayons next to her name). Say: "Afomia has 3 more crayons then Jill" (have students write Afomia's name and ask them how many crayons should we draw?). (Start by drawing the 2 crayons Jill has and draw 3 more crayons). Ask: "how many crayons does Afomia have?" Afomia has 5 crayons, 5 is more than 2 so this makes sense because Afomia has more crayons than Jill.* ● Try one more problem, only this time draw a picture to go with a problem that has fewer. ● *Say: "Finn has 7 crayons" (have students write Finn's name and draw 7 crayons after it). "Sophia has 6 fewer crayons then Finn" (have students write Sophia's name). Ask students to think about how many crayons Sophia should have, suggest that 6 of Finn's crayons shouldn't match up with Sophia's, draw empty lines down on 6 of Finn's crayons (have students do the same in their journals). There is 1 crayon left, draw in Sophia's crayon (draw in a crayon for Sophia). Ask: "how many crayons does Sophia have?". Sophia has 1 crayon, this makes sense because Sophia has fewer crayons and 1 if fewer than 7.* *Appendix E is an example of what the student journal should look like. **Close:** ● Go over the vocabulary words and definitions one more time on the board. ● Ask students what strategy they used today (student response) and repeat that drawing pictures helps when you compare 2 things.	
6	**Learning Target:** I can solve math word problems by acting them out.	Act it Out Cards (Appendix H)

	Go Over Vocabulary: ● Explain that today we are going to solve math problems by acting them out. Go over the vocabulary words on the math word wall, ***many, more*** and ***fewer***. **Acting Out Story Problems:** ● Explain that today students will be in small groups and they will practice acting out story problems. They will be in small groups of 3 and rotate taking turns with the 3 different parts they have narrator and 2 characters. ● Remind students that the purpose of acting out the stories is for them to understand how to answer the question with how ***many*** and to understand the difference between ***more*** and ***fewer***. ● Model by showing the example of an act it out card. ● Explain that on each card the students get there will be 2 acting out parts and 1 narrator. It will also say what materials they will need from around the classroom. ● Read sample card: "*Narrator, Janet and Carlos.* *Narrator Reads: Janet has 7 books. Carlos gives Janet 2 more books. How many books does Janet have?* *Janet: Holds 7 books. Takes 2 books from Carlos.* *Carlos: Walks over and gives Janet 2 books".* ● Ask for 2 volunteers to be Janet and Carlos. Read the card again and have Janet and Carlos do the actions. ● Tell students that after they have done their skits 3 times, every student playing each part, they will get to share their skit with the class and have their classmates answer the how ***many*** question. ● Break students into small groups of 3 and give them a "Act it Out Card". Have students practice. **Closing:** ● Have each group of students act out their skits, while the rest of the class solves their math problems on the whiteboard.	Whiteboard
7	**Learning Target:** I can compare items by using the vocabulary ***many more***. **Review** ● Go over the vocabulary ***more*** and ***many***. ● ***More*** is a bigger or greater amount and ***many*** is an answer	Example Problem (Appendix I)

	with a specific number. ● Explain that today we will be looking at problems that are comparing 2 items with the words ***many more***. We will be figuring out which item is ***more*** and a specific number for how ***many more*** it is. **Drawing:** ● Draw 7 blue balloons and 5 red balloons on the board. ● *Ask students: "which color of balloons there are more of?"*. (blue balloons) ● Explain that today our question how ***many more*** is going to be looking at how ***many*** of the blue balloons are "extra" compared to the red balloons. (Draw lines on the board connecting a blue balloon to a red balloon (there should be 2 blue balloons that do not match a red balloon so they don't have a line, these are the "extra's" that will show how many more)). Say: "there are 2 blue balloons that don't match up with a red balloon, this means there are 2 ***more*** *blue balloons. The answer to our question, how* ***many more*** *blue balloons are there? Our answer is 2* ***more***". **Journal:** ● Have students glue the frogs and butterflies example in their notebooks. (Appendix I). ● *Ask students: "which animal is there* ***more*** *of?" (frogs)* ● *Ask the students: "how* ***many*** *frogs there are?" (4)* ● *Ask students: "how* ***many more*** *frogs there are than butterflies?"* ○ Help students solve this by drawing a line from a frog to a butterfly. How many "extra" or more frogs are there? (2) ● Have students draw a picture of the following math comparison problem. ○ *There are 6 blue birds sitting in a tree (draw 6 blue birds) and 9 red birds sitting in a tree (draw 9 red birds). How* ***many more*** *red birds are there than blue birds.* ● Ask students which type of bird are there ***more*** of? (red birds) ● Ask students how ***many*** red birds there are? (9) ● Now how ***many more*** red birds are there than blue birds? *(draw a line from a blue bird to a red bird, look at how many "extra" red birds there are). (3)*	

	Closing: ● Talk about how today we took 2 of our vocabulary words and put them together and showed how the meaning changed a little. ***Many more*** is talking about a specific amount that is different about 2 items.	
8	**Learning Target:** I can compare items by using the vocabulary ***many fewer***. **Review** ● Go over the vocabulary ***fewer*** and ***many***. ● ***Fewer*** is a smaller or less amount and ***many*** is an answer with a specific number. ● Explain that again today we will be looking at problems that are comparing 2 items but today we will use the words ***many fewer***. We will be figuring out which item is ***fewer*** and a specific number for how ***many fewer*** it is. **Drawing:** ● Draw 8 blue balloons and 3 red balloons on the board. ● *Ask students: "which color of balloons there are **fewer** of?". (red balloons)* ● Explain that today our question how ***many fewer*** is going to be looking at ***how many fewer*** red balloons there are than the blue balloons by looking at what does not match up. (Draw lines on the board connecting a blue balloon to a red balloon (there should be 5 blue balloons that do not match a red balloon so they don't have a line, these are the "extra's that will show how ***many fewer*** *red balloons there are*)). Say there are 8 "extra blue balloons that do not match up with a red balloon, this shows us that there are 5 ***more*** blue balloons and it also tells us that there are 5 ***fewer*** red balloons". **Journal:** ● Have students glue and example picture of frogs and butterflies in their notebooks, this is the same picture from the day before. (Appendix I). ● Ask students which animal is there ***fewer*** of? (butterflies) ● Ask the students how ***many*** butterflies there are? (2) ● Ask students how ***many fewer*** butterflies there are than frogs? ○ Help students solve this by drawing a line from a	Example Problem (Appendix I)

	frog to a butterfly. How ***many*** frogs don't have a match? (2) ● Discuss how today and yesterday we had 2 different questions, *how **many more*** frogs? and how ***many fewer*** butterflies? Because we were comparing the same 2 items both days we got the same answer, 2. ● Have students draw a picture of the following math comparison problem. ○ *There are 7 purple flowers in a vase (draw 7 purple flowers) and 6 orange flowers (draw 6 orange flowers). How **many fewer** orange flowers are there than purple flowers?* ● Ask students which flowers are there ***fewer*** of? (orange) ● Ask students how ***many*** orange flowers there are? (6) ● Now how ***many fewer*** orange flowers are there than purple flowers? (have students draw lines to answer the question). (1) **Closing:** ● Talk about how today we took 2 of our vocabulary words and showed how the meaning changed a little. ***Many fewer*** is talking about a specific amount that is different about 2 items.	
9	**Review** ● Explain that today students are going to review different types of comparison word problems by acting them out with real objects. ● Model by acting out the problem below ○ *There are 5 green blocks and 7 red blocks (lay the blocks out on the floor). How **many more** red blocks are there than green blocks? (Think aloud that there are more red blocks, and 7 red blocks). Line up the blocks and notice that 2 of the red blocks don't match the green blocks). There are 2 **more** red blocks.* ● Have students get in groups of 3 to solve a problem with objects to act out. Students will then act out their problems in front of the class.	Review Problems (Appendix J)
10	**Students will take the post-assessment** ● Read all questions aloud to students. ● Have students go back to their work space, read each question slowly three times while students try their best to solve.	Post-assessment (Appendix C)

	● Allow students to work at their own pace, reread questions to students as needed.	

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APPENDICES

Appendix A: *Checklist*

Vocabulary Strategy	**Who/Where it is from**	**Day 1**	**Day 2**	**Day 3**	**Day 4**	**Day 5**	**Day 6**	**Day 7**	**Day 8**	**Day 9**	**Day 10**
Vocab Defined & Written	Ediger, 2008		**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	
Sentence Frames	Barrow, 2014		**X**					**X**	**X**		
Gestures	Barrow (2014)		**X**								
Vocab Journal	Barrow (2014) King (2016)		**X**	**X**	**X**						
Real Objects and Demonstrations	King (2016)			**X**	**X**					**X**	
Skit/Acting it out	King (2016)						**X**			**X**	
Drawing	King (2016)		**X**			**X**		**X**	**X**		

Appendix B: *Pre-assessment*

Name: _____

Pre-assessment

1. Ben has 4 cookies. Jen has 3 more cookies than Ben. How many cookies does Jen have?

2. There are 7 pink flowers and 9 purple flowers in a vase. How many fewer pink flowers are there than purple flowers?

3. There are 3 fish in a pond. There are 2 fewer turtles than fish in the pond. How many turtles are in the pond?

4. There are 7 zebras and 2 elephants at the zoo. How many more zebras are there than elephants?

Appendix C: *Post Assessment*

Name: _____

Pre-assessment

1. Jill has 5 cookies. Brody has 2 more cookies than Ben. How many cookies does Jen have?

2. There are 6 orange flowers and 10 red flowers in a vase. How many fewer orange flowers are there than red flowers?

3. There are 5 dolphins swimming. There are 2 fewer whales than dolphins swimming. How many whales are swimming?

4. There are 9 monkeys and 4 giraffes at the zoo. How many more monkeys are there than giraffes?

5. Write your own word problem using the words, many, more or fewer.

_____

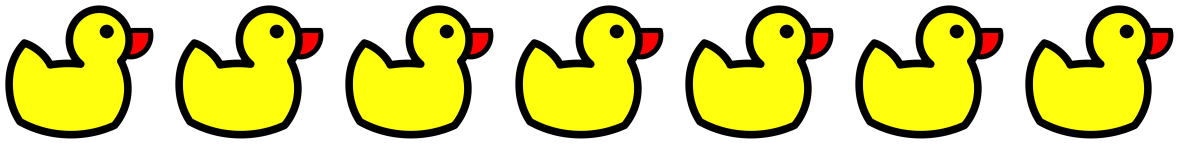
_____

_____

_____

Appendix D: *Example Problem*

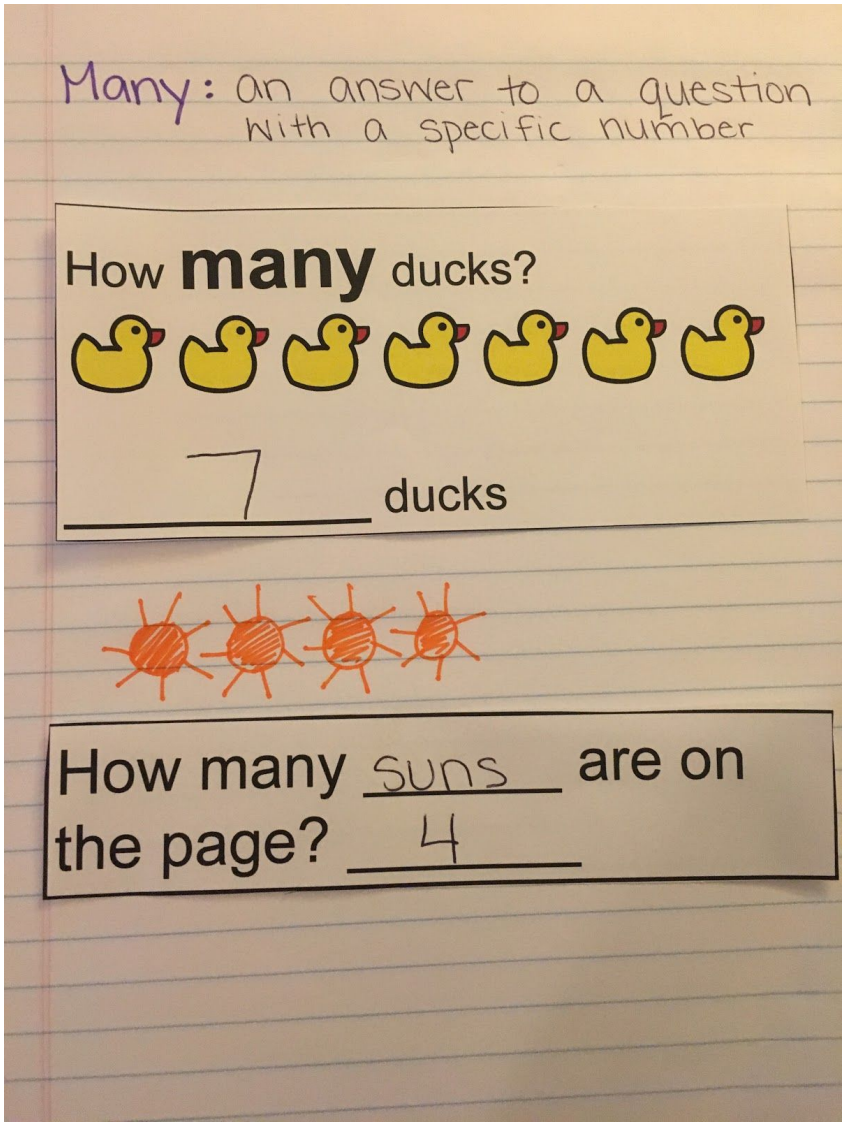
How **many** ducks?



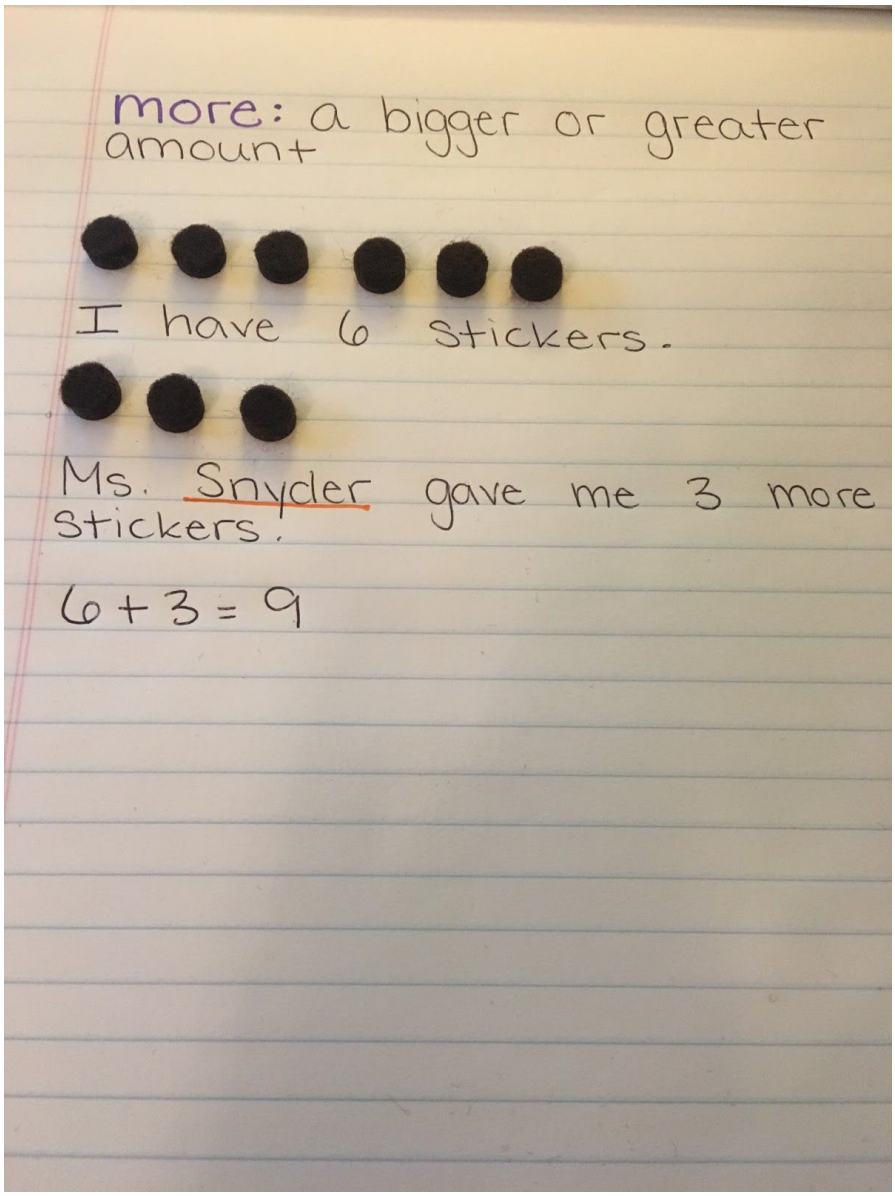
_____ ducks

Appendix E: *Student Journal Examples*

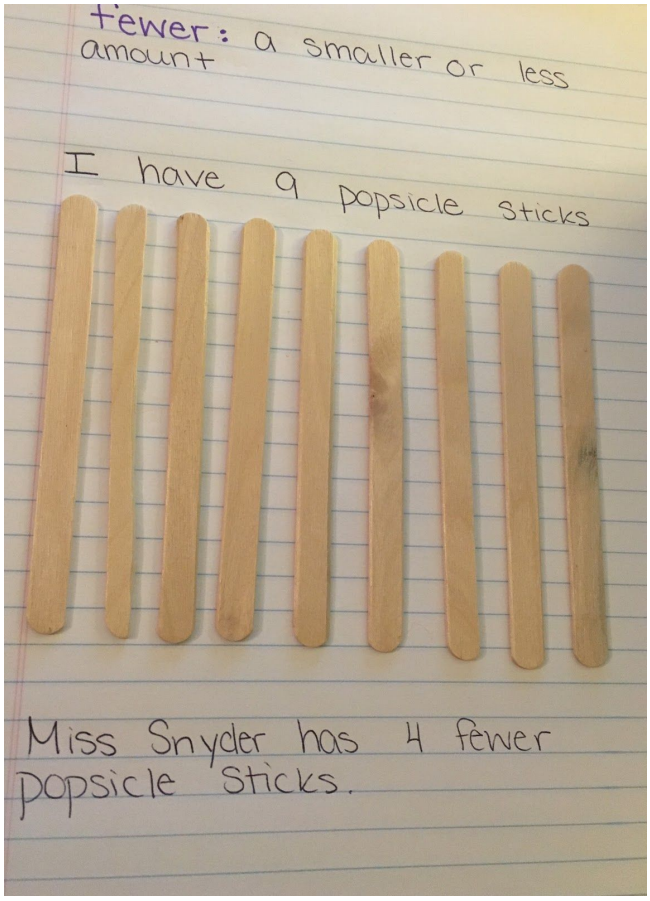
Day 2:

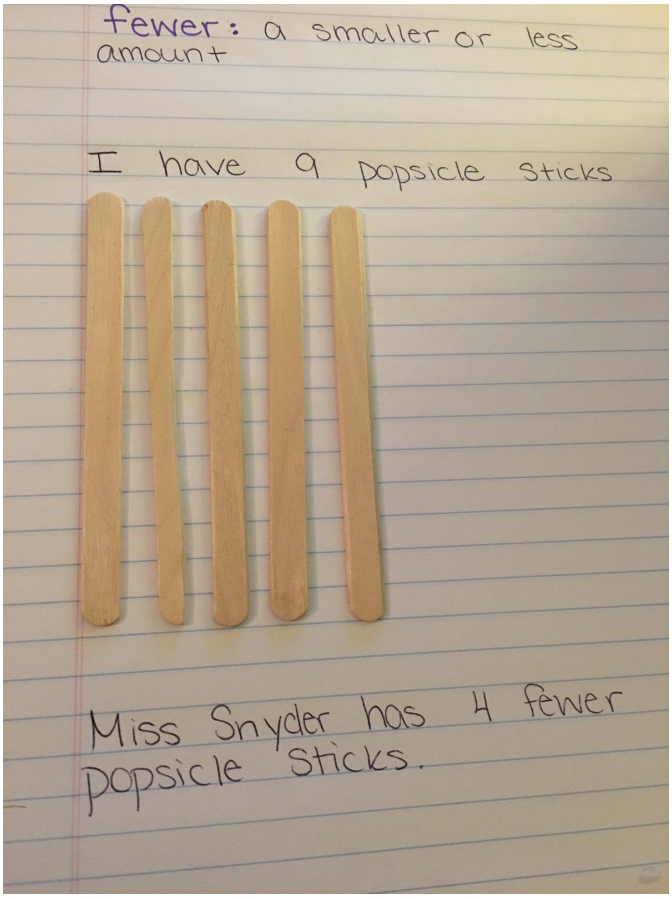


Day 3:

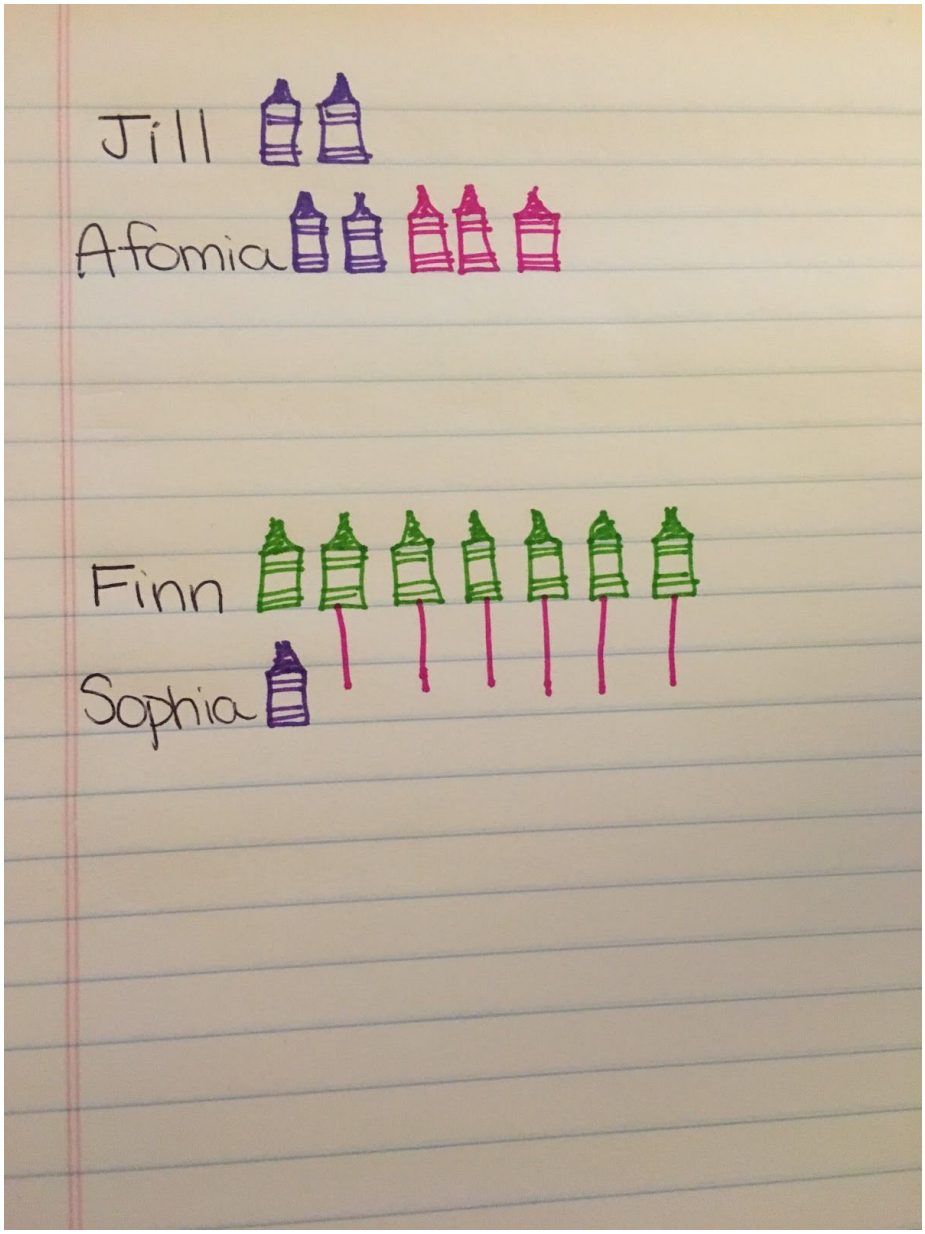

more: a bigger or greater amount
I have 6 stickers.
Ms. Snyder gave me 3 more stickers.
6 + 3 = 9

Day 4:

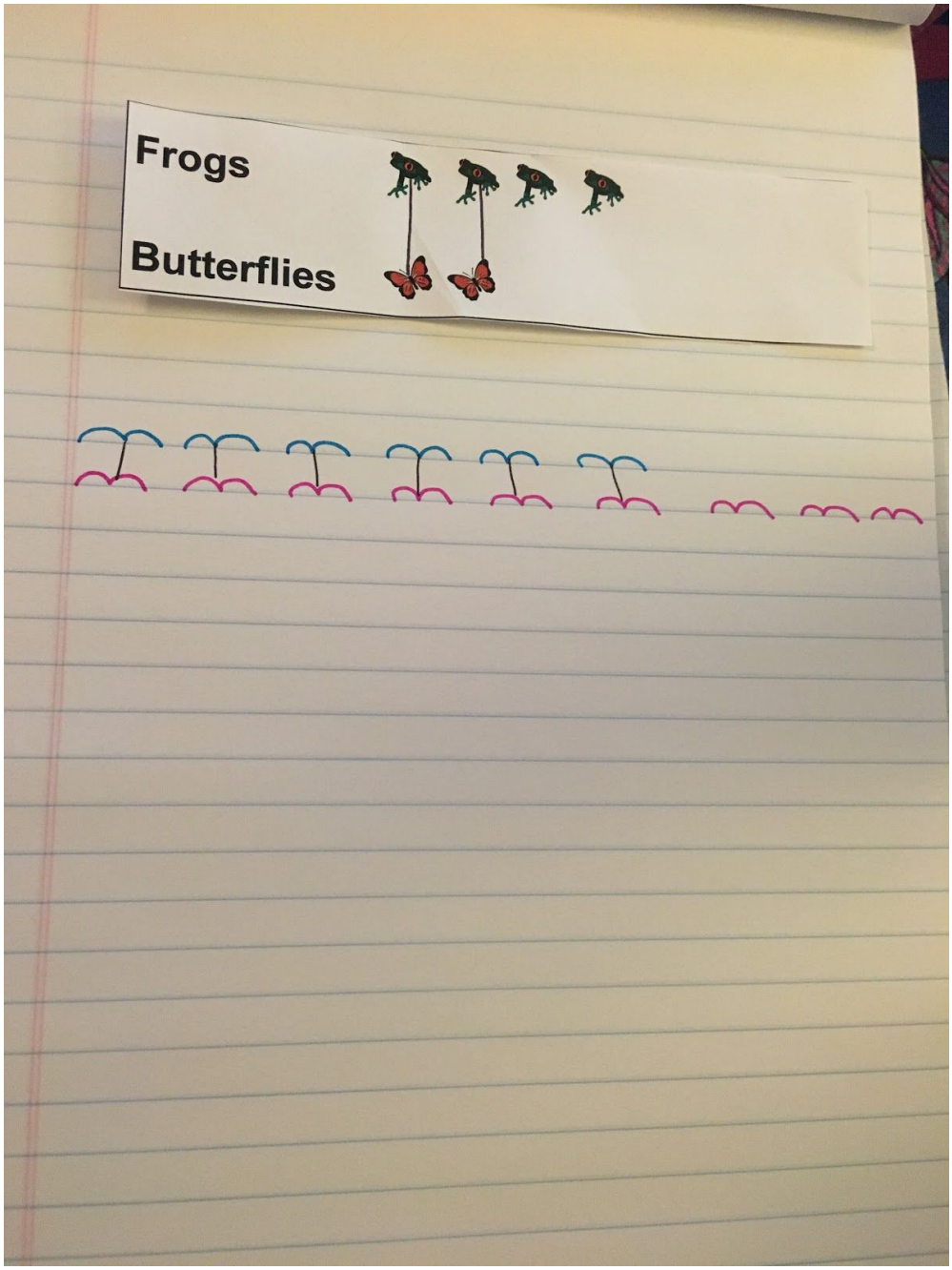

fewer: a smaller or less amount
I have 9 popsicle sticks
Miss Snyder has 4 fewer popsicle sticks.


fewer: a smaller or less amount
I have 9 popsicle sticks
Miss Snyder has 4 fewer popsicle sticks.

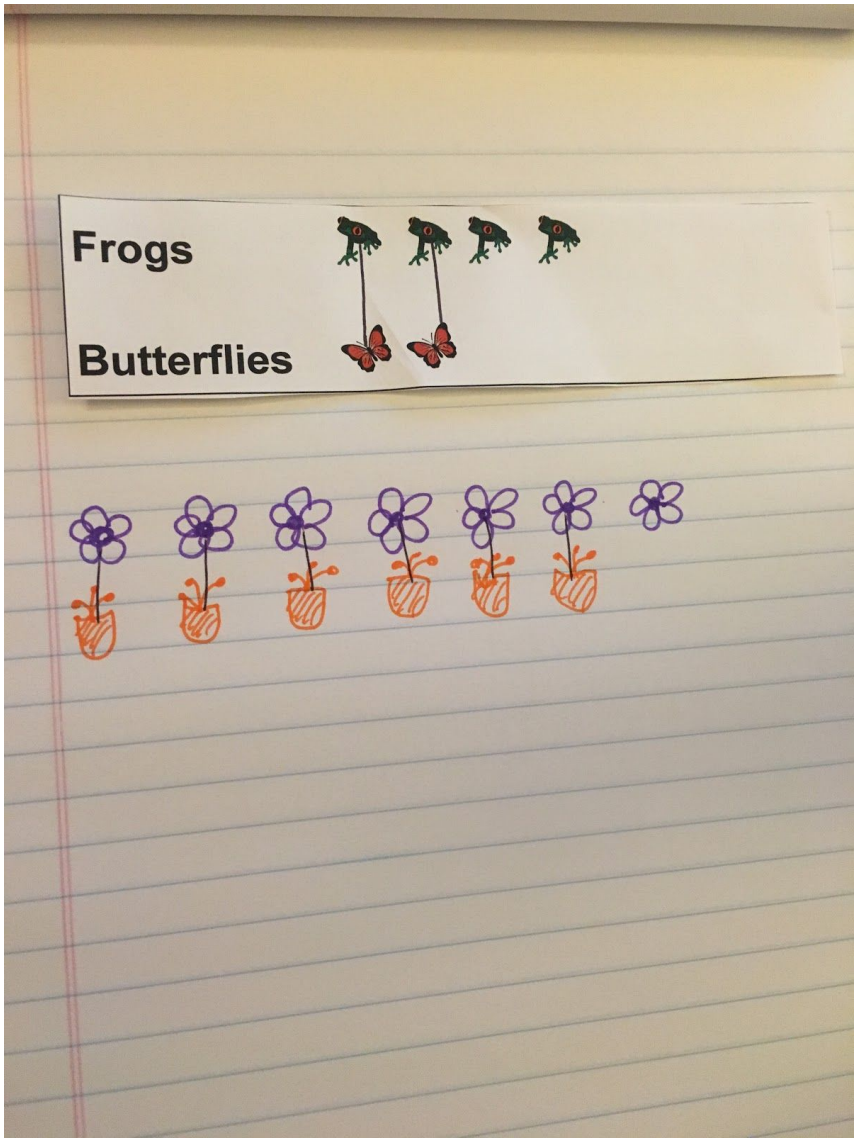
Day 5:



Day 7:



Day 8:



Appendix F: *Vocabulary Cards*

Many

An answer to a question with a specific number.

More

A bigger or greater amount or adding on to get a bigger or greater amount.

Fewer

A smaller or less amount.

Appendix G: *Sentence Frame*

How many _____ are on the page? _____

Appendix H: *Act it Out Cards*

Narrator, Janet and Carlos ***Materials: Books*** ***Narrator Reads:*** *Janet has 7 books. Carlos gives Janet 2 more books. How many books does Janet have.* ***Janet:*** *Holds 7 books. Takes 2 books from Carlos.* ***Carlos:*** *Walks over and gives Janet 2 books*

Narrator, John, Sara **Materials: Rocks** **Narrator Reads:** John and Sara are walking down the street. John has 3 rocks. Sara finds 2 more rocks. How many rocks do they have now? **John:** Walks with Sara holding 3 rocks. **Sara:** Walks with John, finds 2 rocks and picks them up.	**Narrator, Sam, Ron** **Materials: Crayons** **Narrator Reads:** Sam has 6 crayons. Ron gives Sam 6 more crayons. How many crayons does Ron have? **Sam:** Has 6 crayons, takes 6 crayons from Ron. **Ron:** Gives 6 crayons to Sam.
Narrator, Danny and Val **Materials: Markers** **Narrator Reads:** Val has 7 markers. Danny gives Val 4 more makers. How many markers does Val have? **Val:** Has 7 markers, takes 4 markers from Danny. **Danny:** Gives 4 markers to Val.	**Narrator, Victor, Beth** **Materials: Blocks** **Narrator Reads:** Victor and Beth have 2 blocks. Beth finds 7 more blocks. How many blocks do they have now? **Victor:** Has 2 blocks. **Beth:** Finds 7 blocks.
Narrator, Emily, Sean **Materials: Pencils** **Narrator Reads:** Emily has 6 pencils. Sean gives Emily 7 more pencils. How many pencils does Emily have? **Emily:** Has 6 pencils, gets 7 pencils from Sean. **Sean:** Gives 7 pencils to Emily.	**Narrator, Emma and Phil** **Materials: Pillow** **Narrator Reads:** Phil has 1 pillow. Emma gives Phil 2 more pillows. How many pillows does Phil have? **Emma:** Gives Phil 1 pillow. **Phil:** Walks over and gives Janet 2 books
Narrator, Abby, Ryan **Materials: Stickers** **Narrator Reads:** Abby has 5 stickers. Ryan	**Narrator, Davis, Kari** **Materials: Magnets** **Narrator Reads:** Davis has 9 magnets. Kari

has 2 fewer stickers than Abby. How many stickers does Ryan have? **Abby:** Holds 5 stickers. **Ryan:** Takes away 2 of Abby stickers and holds the remaining stickers.	has 3 fewer magnets. How many magnets does Kari have? **Kari:** Takes away 3 of Davis' magnets and holds the remaining magnets from Davis. **Davis:** Holds 9 magnets.

Appendix I: *Example Problem (2)*

Frogs 

Butterflies 

Appendix J: *Review Problems*

There are 7 purple pencils and 9 orange pencils. How many fewer purple pencils are there than orange pencils?	Jill has 7 containers or playdough. Mike has 2 containers of playdough. How many more containers of playdough does Jill have than Mike?
There are 6 hardcover books and 8 paperback books. How many more paperback books are there than hardcover books?	Jeff has 9 red crayons. Rose has 3 yellow crayons. How many fewer crayons does Rose have then Jeff?
Scott made a block tour with 5 blocks. Misra made a block tour with 8 blocks. How many more blocks did Misra use than Scott?	There are 3 glue bottles and 8 glue sticks. How many more glue sticks are there than glue bottles?
Ryan has 12 legos. Liz has 8 legos. How many fewer legos does Liz have than Ryan?	There are 2 orange markers and 6 green markers. How many fewer orange markers are there than green markers?