



Math INTERVENTION SESSION PLAN – Ratios

Student(s):

ACM:

Week #:

Dates:

DESSA Focus(es):

Plan Flow

(What CCSS standard and specific scaffolded skill/s are targeted in this session?)

CCSS Grade Level Math Standard:

6.RP.1: Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. For example, “The ratio of wings to beaks in the bird house at the zoo was 2:1, because for every 2 wings there was 1 beak.” “For every vote candidate A received, candidate C received nearly three votes.”

Skill #1: ‘Write ratio notation - $_:_$ to $_/_$

*** EngageNY Lesson: Grade 6, Module 1, Topic A, Lesson 7 ***

“Students write expressions that record addition and subtraction operations with numbers.”

*****Exercise #1*****

Exercise 1

Sammy and Kaden went fishing using live shrimp as bait. Sammy brought 8 more shrimp than Kaden brought. When they combined their shrimp they had 32 shrimp altogether.

Learning Objective: Students will be able to write ratio notation in the forms ‘ $_:_$ and $_/_$ BY recognizing part-to-whole and part-to-part relationships between quantities.

KEY VOCABULARY (including *visuals* as you see fit):

- Ratio Notation
- Order
- Ratio
- Quantity
- Unit of Measure
- Part-to-Whole
- Part-to-Part
- Rate
- Generalize
- Multiplicative Relationship
- Represent

Materials: (Example: Strips of paper for creating Tape Diagrams, anchor charts, vocabulary cards, whiteboards, handouts, etc.)

- PRE-PREPARED ANCHOR CHART (see details in ‘Warm-Up’ section)
- PRE-PREPARED VOCABULARY WORDS AND DEFINITIONS (see words in ‘Plan Flow’ above)
- Personal white boards OR separate notebooks/paper to record
- Dry-erase markers



Room Set-Up: (Example: students facing the board, pictures posted, objective written on the board)

- ACM and students around a table
- **All whiteboards and markers** in moved towards center of table
- Students **only** take whiteboard and marker **when ACM invites them to do so**
- **When not actively 'solving' on whiteboards and/or notebooks, etc., all materials should 'take a rest' back towards the middle of the table.**

Mins:	Opening
	<p>Soft Check-In: (2 minutes) (2/20) <i>"Before we engage our minds in math, we need to make sure we're ready by first engaging our brains in a 'mode' (or mood) check. Focusing on a specific process in math requires lots of concentration, so let's make sure our minds are 'checked-in' and 'ready to rock' today's Learning Objective. But, first!":</i> Ask students the below, or modify for your student(s)' specific interests: 1) If you were a FOOD, what FOOD are you feeling most like right now? 2) Why?</p>
	<p>Expectations: (Review the expectations you have for your students in this session.) (2 minutes) (4/20) (FIRST: Review the 'group expectations' you have already developed with your students in the 'Grounding Session Plans' from your 'Intro to Session Planning' training. <i>"In addition to our usual group expectations, we will need to treat our materials, like the whiteboards, papers, markers, and other objects we might be using JUST as respectfully as we have agreed to treat each other. We've all already agreed and decided on these, so we'll just extend them to ALL session 'participants'. =)"</i> EXPECTATIONS FOR USE OF MATERIALS AND/OR MANIPULATIVES: 1) Materials remain in center of table unless ACM has explicitly invited students to begin using them 2) When ACM directs students to return materials to center of table for 'talk and think time', students safely put their materials back in center of table 3) When ACM or any other student is explaining their thinking, asking a question, or otherwise speaking, all students have eyes on speaker and all hands are free materials/objectives/pencils/papers/etc. 4) All students will Campfire their own materials <i>unless otherwise directed by ACM</i></p>
	<p>Warm-Up: (4 minutes) (8/20) <i>"Now that we've got our focus in 'Math Mode', let's make sure our brains are properly 'warmed' by grounding our learning in today's learning objective, what you already know about these topics, and a jumpstart on the vocabulary we're emphasizing in our conversations today."</i></p> <ul style="list-style-type: none"> • Review Learning Objective: <ul style="list-style-type: none"> ○ Review posted Learning Objective (see Plan Flow above) ○ Clarify any questions (or quickly validate any short comments) from students • Activate Prior Knowledge: <ul style="list-style-type: none"> ○ Tell students you are setting your timer for '60 seconds' and they are going to 'call out' all the words (or images!) that come to mind when they see the 3 words you've prepared on the board <ul style="list-style-type: none"> ▪ Have prepared (<i>without definitions</i>) the terms 'ratio' 'order' 'part' 'whole' ▪ Ask your student(s) if they (or would one of them) like to record the 'call-outs', or would they prefer you to do it for them (<i>voice + choice!</i>) ▪ <i>"When the timer goes off, we'll take a look at any 'similarities' between our 'call-outs' around these 3 math terms. Let's see how many words (or images!) we can words we can pull out of our math memories! Ready, set, go."</i>



Once timer has gone off, 'moderate' a conversation with students around any 'similarities' or 'differences' between their 'call-outs'; make sure any 'answer' is fully correct, BUT remember: you must be careful with your words, here, as it's the place for you build up student confidence around their 'prior knowledge', not to push for 'Right is Right'

- **Review/Introduce Vocabulary:**

- **HAVE PREPARED** visual/easy-to-read vocabulary words (including definitions)
- Some *potential* options:
 - 'Flashcards' – word on front, definition on back
 - Already 'written' on whiteboard
 - Already written on paper (notebook, construction paper, etc.)
 - FAST power-point slides
 - Etc.

Transition for Returning to the Anchor Chart:

"Okay, so...over to that Anchor Chart back to that Anchor Chart I showed you when we looked at the Learning Objective! It's going to help 'guide' me through the steps of the process we're using today: "Relating Quantities with Ratio Notation."

Gradual Release of Responsibility

I Do: (3 minutes) (11/20)

(POSTED ANCHOR CHART) Relating Quantities with Ratio Notation

Step 1: Circle the words and numbers I actually care about/are needed to solve the problem (e.g. any units, 'title' of quantities, and the quantities themselves)

Step 2: Identify the quantity that is the 'whole' (e.g. the number near words like 'altogether', 'in total', etc.)

Step 3: Identify the quantities that are the parts (the other relevant numbers that make up the whole)

Step 4: Identify the relationships between each 'part' and the 'whole' (from Steps 2 and 3)

Step 5: Identify the relationship between the 'parts' (from Step 3)

Step 6: Express Step 4 as a Fraction (/ instead of :)

"Great! So, the first thing I'm going to do is 'a Metacognitive Think-Aloud' and model the problem; I will be asking myself questions, and also answering them for myself. I want to make sure I'm making all of my 'thinking' visible to you all, or letting you all 'seeing inside my brain', so make sure your full visual AND auditory attention are directed at me – just for 3 minutes, though – unless I have to stop so

CFUs/OEQs:

(What Checks for Understanding or Open Ended Questions will you use to ensure progress at each step?)

- **(for Step 1) Circle the words and numbers I actually care about/are needed to solve the problem** (*Shrimp, Sammy, Kaden, 8, 32*)
- **(for Step 2) Identify the quantity that is the 'whole'** (*32 Shrimp*)
- **(for Step 3) Identify the quantities that are the parts** (*Sammy – 20 Shrimp, Kaden – 12 Shrimp*)
- **(for Step 4) Identify the relationships between each 'part' and the 'whole'** (*20:32, 12:32*)
- **(for Step 5) Identify the relationship between the 'parts'** (*20:12*)



<p><i>we can re-focus our attention. So, thank you in <u>advance</u> for giving me those 180 seconds!"</i></p> <p><i>"So, I'M going to model for you all EXERCISE 1, and then WE will do EXERCISE 2 together"</i></p> <p style="text-align: center;">***EXERCISE 1***</p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p>Exercise 1</p> <p>Sammy and Kaden went fishing using live shrimp as bait. Sammy brought 8 more shrimp than Kaden brought. When they combined their shrimp they had 32 shrimp altogether.</p> </div> <p style="text-align: center;"><u>Relating Quantities with Ratio Notation</u></p> <p>(Step 1): Circle the words and numbers I actually care about/are needed to solve the problem (e.g. any units, 'title' of quantities, and the quantities themselves)</p> <p>(Step 2): Identify the quantity that is the 'whole' (e.g. the number near words like 'altogether', 'in total', etc.)</p> <p>(Step 3): Identify the quantities that are the parts (the other relevant numbers that make up the whole)</p> <p>(Step 4): Identify the relationships between each 'part' and the 'whole' (from Steps 2 and 3)</p> <p>(Step 5): Identify the relationship between the 'parts' (from Step 3)</p> <p>(Step 6): Express Step 4 as a fraction (/ instead of :)</p> <p>***WHAT TO DO IF YOU HAVE TO GO BACK TO THE I DO/IF STUDENTS CANNOT ANSWER QUESTIONS IN THE WE DO***: 'Re'-Model with what WOULD'VE been the first 'We Do' problem (see We Do section below)</p>	<ul style="list-style-type: none"> ▪ (for Step 6) Express Step 4 as a fraction ($20/32$, $12/32$) <p>***Metacognitive CFU: How am I feeling about writing using ratio notation, and why might I feel that way?</p> <p>Thumbs Up: That felt good! I think I'll remember how to do this next time.</p> <p>Thumbs Sideways: I think I could use some more practice!</p> <p>Thumbs Down: I'm still feeling lost!</p>
<p><u>We Do:</u> (5+ minutes)</p> <p><i>"Thank you for your focused visual and auditory attention! Now we'll get going together."</i></p> <p><i>"Before we can get any materials, though, let's make sure we can explain which materials we're each going to take and what, specifically, we will be using them to do as it relates to RELATING QUANTITIES USING RATIO NOTATION"</i></p> <p>***Take 1 or more student responses/explanations about the materials and their purposes for this session***</p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p>Exercise 2</p> <p>A food company that produces peanut butter decides to try out a new version of its peanut butter that is extra crunchy, using twice the number of peanut chunks as normal. The company hosts a sampling of its new product at grocery stores and finds that 5 out of every 9 customers prefer the new extra crunchy version.</p> </div> <p style="text-align: center;"><u>Relating Quantities using Ratio Notation</u></p> <p>Step 1: Circle the words and numbers I actually care about/are needed to solve the problem (e.g. any units, 'title' of quantities, and the quantities themselves)</p>	<p style="text-align: center;"><u>CFUs/OEQs:</u></p> <p><i>(What Checks For Understanding or Open Ended Questions will you use to ensure progress at each step?)</i></p> <ul style="list-style-type: none"> • (for Step1) How do we know which words and numbers I actually care about? (<i>units, 'title' of quantities, quantities/values</i>) • (for Step 2) How do we know which quantity is the whole? (<i>the 'biggest' one or the one followed by 'altogether', 'in all', etc.</i>) • (for Step 3) How do we know which quantities are the



<p>Step 2: Identify the quantity that is the ‘whole’ (e.g. the number near words like ‘altogether’, ‘in total’, etc.)</p> <p>Step 3: Identify the quantities that are the parts (the other relevant numbers that make up the whole)</p> <p>Step 4: Identify the relationships between each ‘part’ and the ‘whole’ (from Steps 2 and 3)</p> <p>Step 5: Identify the relationship between the ‘parts’ (from Step 3)</p> <p>Step 6: Express Step 4 as a Fraction (/ instead of :)</p> <p>***WHAT TO DO IF I HAVE TO GO BACK TO THE I DO/IF STUDENTS CANNOT ANSWER QUESTIONS IN THE WE DO***:</p> <p>Optional ‘rounds’ for We Dos and/or final You Do: Alyssa’s extended family is staying at the lake house this weekend for a family reunion. She is in charge of making homemade pancakes for the entire group. The pancake mix requires 2 cups of flour for every 10 pancakes.</p> <p>1. Write a ratio to show the relationship between the number of cups of flour and the number of pancakes made.</p> <p>***I will know your students are ready to move to the 'You Do' because <i>they'll be trying to get ahead of me and start the next ones on their own.</i></p>	<p>‘parts’? (<i>the quantities that are less than the ‘whole’; the numbers that, put together, form the ‘whole’</i>)</p> <ul style="list-style-type: none"> • (for Step 4) How do we show how each part relates to the whole using ratio notation? (<i>value of the part : value of the whole</i>) • (for Step 5) How do we show how one part relates to another part using ratio notation? (<i>value of a part : value of another part</i>) ▪ (for Step 6) How do we express our answers to Steps 4 and 5 using fractions? (<i>same numbers, but ‘/’ instead of ‘:’</i>) <p>***Metacognitive CFU: How are we feeling about using ratio notation to relate quantities, and why might we feel that way?</p> <p>Thumbs Up: That felt good! I think I'll remember how to do this next time.</p> <p>Thumbs Sideways: I think I could use some more practice!</p> <p>Thumbs Down: I'm still feeling lost!</p>
<p>You Do: (if my students needed more practice in the We Do when my time with them is up, I WILL RETURN TO THIS SESSION WHEN I SEE THEM AGAIN, beginning with an I Do (this serves as my ‘Activating Prior Knowledge, and I are not introducing any new vocabulary; then start right back up where I left of with them in the ‘We Do’)</p> <p>Once my students have expressed their desire or readiness to ‘do one on their own’, I will make sure I’m taking notes on their ‘process’ and any errors they might be making. These will inform either a) the rest of the session or b) my planning for the next session.</p>	<p>CFUs/OEQs: <i>(What Checks For Understanding or Open Ended Questions will you use to ensure progress at each step?)</i></p> <p>‘Which resource might you use to remember what we did at that step?’</p>



	<p>A food company that produces peanut butter decides to try out a new version of its peanut butter that is extra crunchy, using twice the number of peanut chunks as normal. The company hosts a sampling of its new product at grocery stores and finds that 5 out of every 9 customers prefer the new extra crunchy version.</p> <p>a. Let's make a list of ratios that might be relevant for this situation.</p> <p>i. The ratio of number preferring new extra crunchy to total number surveyed is to ____.</p> <p>ii. The ratio of number preferring regular crunchy to the total number surveyed is to ____.</p> <p>iii. The ratio of number preferring regular crunchy to number preferring new extra crunchy is to ____.</p> <p>iv. The ratio of number preferring new extra crunchy to number preferring regular crunchy is to ____.</p>	<p>(or any other 'cheerleading advice' (as long as you don't tell your student(s) 'what to do'))</p> <p>***Metacognitive CFU:</p> <p>How are <u>you</u> feeling about relating quantities using ratio notation, and why might you feel that way?</p> <p>Thumbs Up: That felt good! I think I'll remember how to do this next time.</p> <p>Thumbs Sideways: I think I could use some more practice!</p> <p>Thumbs Down: I'm still feeling lost!</p>
Mins:	<p>Closing:</p> <p><i>(What final check for understanding are you using? How will you ensure the learning objective was met?)</i></p> <p>(Examples: exit ticket, Twitter post, practice problem, real world connection, etc.)</p> <p>Once my students have taken a stab at, or finished, their 'You Dos', make sure all pencils, papers, materials, etc. get <u>carefully</u> placed back into the middle of the table. Let them know that you all will be pushing their brains one last step – by reflecting on the process they learned today.</p> <ul style="list-style-type: none">Invite students to come up with a ratio that has to do with their math class! Support them in coming up with ideas (e.g., 'girls:boys' or, 'soccer players:not soccerplayers', etc.)Moderate the conversation, making sure you are reminding your students of NOSTUESO, and ensuring you get a chance to hear each student's response to the question. PARAPHRASE for clarity, especially if a student gives a 'not quite' response.	



- **Quickly summarize** what they did today and how it relates to what they'll be doing next when they see you again.
- **Qualify your praise** for students with some authentic things you noticed that they did today that relates to one of their own SEL or Academic goals.

"Bring it in on a thumb break!"

Reflection and SSM Commitments:

What worked well in this session? What could have gone better? How well did the students master the learning objective? What are your next steps? What updates will you make to your SSM?