Planning Commentary Directions: Respond to the prompts below (no more than 9 single-spaced pages, including prompts) by typing your responses within the brackets following each prompt. Do not delete or alter the prompts; both the prompts and your responses are included in the total page count allowed. Refer to the evidence chart in the handbook to ensure that this document complies with all format specifications. Pages exceeding the maximum will not be scored.

1. Central Focus
   a. Describe the central focus and purpose for the content you will teach in this learning segment.

   [The central focus and purpose for the content I will be teaching in this learning segment is rates and ratios. The purpose for the ratio content is that the student will be able to know that ratios are used to compare parts to a whole or to compare parts within a whole. Another purpose for teaching the content is that the student will be able to apply the relationship between ratios, equivalent fractions and percents to solve problems in various contexts, including those involving mixtures and concentrations. The students will also be able to determine the rate for ratios of quantities with different units. The purpose of the rates content is that the student will be able to learn that when you want to find out how much time it takes to do a large number of the same item, you are looking for the rate of time. The students will also be able to know that when you want to find out the speed of someone or something, you are looking for the rate of speed. Students will use reasoning about multiplications and division to solve ratio and rate problems.]

   b. Given the central focus, describe how the standards and learning objectives within your learning segment address:

   - Conceptual understanding

   [Conceptual understanding will be the focus with day one’s lesson on ratios. The content objectives are that the students will be able to explore his/her multicolored candy bag and recognize the colors as parts to a whole bag that represent different concentrations and the students will be able to compare individual colors to other colors and the candy bag’s total. The language objectives include: the students will be able to describe their bag to their peers using colors, numbers, and comparisons and the students will be able to represent data with a poster that is generated by his/her findings. The academic standards are being met in 6.1.2.2 by having the students apply the relationship between ratios, equivalent fractions and percents to solve problems in various contexts, including those involving mixtures and concentrations. The students will also have to understand that percent represents parts out of 100 and ratios to 100 in describing their bag of candy to me (6.1.1.3).

   According to the rates content being introduced on day three, the student’s will gain conceptual understanding in participating in an activity that deals with finding rate of speed and rate of time. The students will fitness walk a prescribed distance for 5 minutes and then take their pulse to find their heart rate. The objectives of this lesson are that the students will be able to calculate their rate of speed and heart rate for fitness walking. The students will be able to determine if at the same rate, how many laps they would fitness walk for longer periods of time. These objectives meet the standards 6.1.2.3 and 6.1.2.4 which state that the students will determine the rate for ratios of quantities with different unites and use reasoning about multiplication and division to solve ratio and rate problems.

   - Procedural fluency]
[Procedural fluency will be gained by giving students an opportunity on day two to apply the relationship between ratios, equivalent fractions and percents to solve problems in various contexts as addressed by benchmark number 6.1.2.2. The students will learn in whole group lesson that ratios can be expressed in different forms such as fraction form, using a colon, in words, and percent form. Once students know that ratios are used to compare parts to a whole or to compare parts within a whole, the fraction form will be used and to convert the ratio to percent form. Then, the students will be returning to their posters created on day one to describe their candy bag in colors, numbers and comparisons and apply symbolic level representations such as fraction form, using a colon, in words and percent form for their ratios.

For the rates content, procedural fluency will be addressed on day 3 after the students are given a conceptual task to complete. The content objective for this lesson is the students will be able to calculate their rate of speed and heart rate for fitness walking. The language objective is that the students will be able to determine if at the same rate, how many laps they would fitness walk for longer periods of time and represent data with procedural fluency. The standards that are met through these objectives are 6.1.2.3 Determine the rate for ratios of quantities with different units and 6.1.2.4 Use reasoning about multiplication and division to solve ratio and rate problems. Whole group lesson will consist of having students analyze their recordings for how many laps they walked for 5 minutes and what their heart rate was for 1 minute. Procedural fluency will be modeled on the board for students to apply their conceptual understanding to how they would calculate problems that deal with rate of time and rate of speed in their homework packet. ]

- **Mathematical reasoning OR problem solving skills**

[Mathematical reasoning skills will be address through the benchmark 6.1.2.4 which states the students will be able to use reasoning about multiplication and division to solve ratio and rate problems. The bulk of this will be executed on day 4 of the lesson on rates. The content objectives of the lesson is that the students will be able to apply the previous days rate activities to calculate rate of speed if they were to increase their time and maintain the same rate. The students will be able to apply the previous day’s rate activities to generate three different ways of expressing their heart rate. The language objectives for this lesson is that the students will be able to explain in writing the steps they took to calculate rate of speed if they were to increase their time and maintain the same rate. The students will also be able to describe how the three different ways to express their heart rate is equivalent to the original beats per minute. These objectives match the standards 6.1.2.3 Determine the rate for ratios of quantities with different units and 6.1.2.4 Use reasoning about multiplication and division to solve ratio and rate problems.]

c. Explain how your plans build on each other to help students make connections between facts, concepts, computations/procedures, and reasoning/problem solving strategies to deepen their learning of mathematics.

[ Day one is on building a foundation for the students to think conceptually about ratios. Once the students can conceptually understand ratios at an object level by describing candy bags in colors, numbers and comparisons, they can transition to procedural fluency. This begins on day two after the students participate in whole group lesson. The students will go back to their posters created that describe their candy bags and write their findings in fraction form, using a colon, in words and in percent form. This lessons builds off of day one’s lesson based on]
implementing the students with conceptual understanding to day two where the student utilize
day one explorations and connect it to ratios procedural fluency. Day three picks up from the
lessons on ratios and begins with a conceptual understanding of rates in an exercise activity
that measures rate of speed and heartbeat. After students learn that ratios are used to compare
parts to a whole or to compare parts within a whole, they will be introduced to the concept that
rates are used to find out how much time it takes to do a large number of the same item (rate of
time) and when you want to see how fast someone or something went (rate of speed).
Conceptual understanding is then linked to applying it to procedural fluency of calculating rates
in word problems. On day four, the students will be given a mathematical reasoning and
problem solving skills challenge to use their rate recordings from day three and calculate their
rate of speed if they were to maintain the same rate and increase their time. The students will
also generate three different ways of expressing their heart rate from day three by determining
when to use multiplication and division to solve rates.]

2. Knowledge of Students to Inform Teaching

For each of the prompts below (2a–c), describe what you know about your students with
respect to the central focus of the learning segment.

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

a. Prior academic learning and prerequisite skills related to the central focus—What do
students know, what can they do, and what are they learning to do?

Prior academic learning and prerequisite skills related to the central focus include:
Changing fractions to decimals, changing decimals to fractions, addition, subtraction,
multiplication, and division of decimals; simplifying fractions, changing percents to decimals and
decimals to percents, and changing percents to fractions and fractions to percents. These
content areas have been a focus for the students over the last 2 months. They are learning the
proper steps to apply to each skill set and when to use them.
Students with IEPs are not labeled with a math disability but will have modified
assignments. There are a handful of students that are underperforming that may need extra
support for these lessons, possibly with the use of grouping with gifted/higher students for peer
mentorship. The concepts are higher leveled concepts, which is why the students will benefit
from multileveled groups as opposed to groups based on math skill levels.

b. Personal/cultural/community assets related to the central focus—What do you know
about your students’ everyday experiences, cultural backgrounds and practices, and
interests?

Diversity applies not only to race but to different cultures, backgrounds, beliefs, and
experiences. My students are very diverse in almost all areas. I know that students work with
ratios and rates on a daily basis and may not even realize it. When they are in the car with their
parents or on the bus, they are experiencing rate in how many miles per hour their car or the
bus is going. All of the student’s sports have some form of a rate or the tasks that need to be
completed in a certain amount of time.

 c. Mathematical dispositions related to the central focus—What do you know about the
extent to which your students
What I know so far about my students when it comes to their perception of math, I believe the majority of them perceive it as boring, useless and a burden. I wish to connect mathematics to the student’s lives and in turn give them the skill set to transfer that connection to pencil and paper work and assessments such as state tests. There are not a lot of students who express their enjoyment in math or their knowledge that math can be used in many useful ways in real life.

Fortunately, most students, except a handful, will be persistent in applying mathematics to solve problems with the right instruction, support, encouragement and resources. There are a handful of students that will become overwhelmed with mathematics and won’t ask for help and stop working all together. These students scored significantly lower on assignments and assessments.

As far as my student’s belief in their ability to learn mathematics, I see them engaged in class and willing to try. Some of the students have expressed to me that they are bad at math. These are the students who need to see that they are capable at math even though they may struggle. The challenge is to get the handful of underperforming learners over the mountain of confusion and dim belief in their mathematic ability and instill in them the skills to recognize what they can already do and what they are capable of learning.

3. Supporting Students’ Mathematics Learning

Respond to prompts below (3a–c). As needed, refer to the instructional materials and lesson plans you have included to support your explanations. Use principles from research and/or theory to support your explanations, where appropriate.

a. Explain how your understanding of your students’ prior academic learning and personal/cultural/community assets (from prompts 2a–b above) guided your choice or adaptation of learning tasks and materials.

After being in this particular class for a 6 week placement and additional 30 clinical hours, I’ve been around to see the student’s prior academic learning and have been able to analyze their previous work. I know there will be a significant range of students at different levels. These levels contribute to different previous educational backgrounds, culture, and developmental level. Knowing the diversity of students in my class, I plan on grouping the students in a heterogeneous fashion.

b. Describe and justify why your instructional strategies and planned supports are appropriate for the whole class and students with similar or specific learning needs.

Consider students with IEPs, English language learners, struggling readers, underperforming students or those with gaps in academic knowledge, and/or gifted students.

1 From the Common Core State Standards for Mathematics
The learning task for ratios will stem from the learning theory of constructivism. Few rules and guidelines will be placed before the students and they will work together to make sense of the concept of ratios. The goal of my day one lesson is not necessarily the products of the task but the process of the student’s thinking and making sense of their bags of candy and describing them to me in meaningful ways. Students will be interacting directly with physical and tangible objects in their learning activity. For day one’s lesson, the student’s play an active role in learning and I, as the teacher, facilitate discussion of the student’s learning. Vygotsky’s theory takes it a step further to say that social interaction plays a significant role in development. The day three lesson on the concept of rates will begin with a day of cooperative conceptual learning in heterogeneous groups for their learning task.

The reasoning behind this is based off of the idea that states “Heterogeneous grouping promotes the development of student-interdependence and the growth of mutual respect. It helps to diminish prejudice as students, working together, develop interdependent relationships and mutual respect (Johnson, D. W. & Johnson, R., 1989).” Other than heterogeneous grouping, I believe that for the conceptual understanding of rates and ratios, cooperative learning is key. Cooperative learning stems from theorists such as Vygotsky and Piaget. They both believed that if a student is paired with more able peers, they are more likely to gain cognitive development and intellectual growth. Another reason is well stated in the quote, “A major element of cooperative learning is positive interdependence, as students perceive that their success or failure depends on working together as a team (Johnson, Johnson, & Holubec, 1986).”

c. Describe common mathematical preconceptions, errors, or misunderstandings within your content focus and how you will address them.

A common misconception within my content focus is that student’s really have trouble connecting that a ratio is a fraction. I will address that ratios compare a part to a whole or a part within a part. For example I could say that ¾ of the class are girls. If the class is ¾ girls, then the ratio of girls to boys is 3 to 4. For every 3 girls, there are 4 boys. Another common misconception for rates is the procedural fluency. Student’s usually have difficulty determining whether to utilize multiplication or division in word problems as well as setting up the problems properly. This could be addressed by reviewing key words that help determine whether to use multiplication or not. For example, if they are given a rate, like tons “per” hour or inches “per” year, that would indicate a multiplication problem.

4. Supporting Mathematics Development Through Language

a. Language Demand: Language Function. Choose one language function essential for student learning within your central focus. Listed below are some sample language functions. You may choose one of these or another language function more appropriate for your learning segment:

<table>
<thead>
<tr>
<th>Categorize</th>
<th>Compare/contrast</th>
<th>Describe</th>
<th>Interpret</th>
<th>Model</th>
</tr>
</thead>
</table>

[Lesson day one and two will be using the language function describe. Lesson days 3-4 will include the interpret language function.]

b. Identify a key learning task from your plans that provides students with opportunities to practice using the language function. In which lesson does the learning task occur? (Give lesson/day number.)

[On day one, the key words for the ratio lessons will be describe. The students will be given a bag of multicolored candy and asked to describe their bags to me in colors, numbers and comparisons. On day two, students will return back to their descriptions from day one and...]

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describe further their findings in fraction form, colon form and percent form. In lessons day 3-4, the students' tasks will include more of an interpret language function. On day three, they will be given a rate task to fitness walk a certain distance for five minutes and interpret their individual rate. They will also interpret their heart rate after taking their pulse for one minute. Day 4 will consist of the students going back to their describe language function to finding three different ways to write their heart rate. The goal is that students will ultimately get to compare/contrast but will not arrive there during these lessons.]

c. **Additional Language Demands.** Given the language function and task identified above, describe the following associated language demands (written or oral) students need to understand and/or use.

- **Vocabulary and/or symbols**
- **Plus** at least one of the following:
  - Syntax
  - Discourse

Consider the range of students’ understandings of the language function and other demands—what do students already know, what are they struggling with, and/or what is new to them?

[Vocabulary-Ratio, simplify, fractional ratio, equivalent, percent form, colon, parts, whole, rate of time, rate of speed, Symbols- ;, /, +, ×

Discourse-

Day 1: “Explain to me some ways that you described your bag of candy”

Day 2: “Apply the fraction form, the use of a colon, in words and percent form to yesterdays descriptions”

Day 3: “Using your rate for fitness walking for 5 minutes, explain how many laps you would complete in 15 if you stayed at the same rate?”

Day 4: “Using your heart rate from yesterday,”

d. **Language Supports.** Refer to your lesson plans and instructional materials as needed in your response to the prompt.

- Describe the instructional supports (during and/or prior to the learning task) that help students understand and successfully use the language function and additional language identified in prompts 4a–c.

[On day one, students will be given an exit slip to fill out at the end of the hour. The exit slip will contain the sentence frame: “Using colors, numbers or comparisions, one description of my MNM bag is:____________.” On day two, the students will be given an exit slip that says,”One way that I learned to express a ratio is:____________.” On day three, ]

5. **Monitoring Student Learning**

Refer to the assessments you will submit as part of the materials for Task 1.

a. Describe how your planned formal and informal assessments will provide direct evidence of students’ conceptual understanding, computational/procedural fluency, and mathematical reasoning/problem solving skills throughout the learning segment.
Informal assessment will be monitored during task times and while analyzing student work. For example, the posters the students will be creating on day one will be used as a tool to measure how well they are doing with the concept of ratios. This will provide me evidence with the students’ conceptual understanding. Formal assessment will be given before the 4 instructional days and the same test will be administered on 5th day after the lessons. The assessment will be based off of the packet and homework assigned throughout the week during procedural fluency based lessons. Analyzing the students' work from day four will be able to assist me in assessing their mathematical reasoning and problem solving skills. Their task will be to interpret and write their discovered heart rate from day three in three different ways.

b. Explain how the design or adaptation of your planned assessments allows students with specific needs to demonstrate their learning.

Consider all students, including students with IEPs, English language learners, struggling mathematics students, underperforming students or those with gaps in academic knowledge, and/or gifted students.

For the student with an IEP, I will modify their formal assessments to 1-2 questions per concept. For example, I may give them a 4 question formal assessment addressing two ratio questions and 2 rates questions. Particular students may also take their assessment in the resource center. There will be no particular adaptation for other students in order to keep data and measurement consistent with the pretest that will be administered before the instructional lessons. The student will be paired with another student based on academic and social skills.