Lesson Objective(s): What mathematical skill(s) and understanding(s) will be developed?

6.RP 1. Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities.

Lesson Launch Notes: Exactly how will you use the first five minutes of the lesson?

Provide small groups of students (2-3 students) should be given the following cubes:

4 yellow
8 blue
3 red
1 orange
4 white

Give each small group a half sheet of paper to respond to the following statement

Write a description of the materials you were given.

Lesson Closure Notes: Exactly what summary activity, questions, and discussion will close the lesson and provide a foreshadowing of tomorrow? List the questions.

Reflect using 3-2-1 think-pair-share

- 3 things you enjoyed
- 2 things found challenging and why
- 1 thing you would like to know about ratios

Lesson Tasks, Problems, and Activities (attach resource sheets): What specific activities, investigations, problems, questions, or tasks will students be working on during the lesson?

1. Lesson Launch - Have students pass their description to another group. Ask the students to read the description and determine if that description matches their cubes (could you recreate the group/set of cubes given that description).
   a. Discuss as a class some of the attributes of their cubes and how they described them.
   b. Discuss the descriptions that were unclear or not specific enough to recreate the group/set.
   c. Identify words or phrases that made the description vague or specific and how these words effect the description.

2. Introduce the idea of a ratio by asking the students to compare the number of red cubes from their materials to the number of blue cubes. Guide students towards making a “to” statement e.g., “There are 3 red cubes to 8 blue cubes.”

3. Post the Comparison Statements found under Resources on the board. Have students verbally respond using the “to” statement that expressed the comparison. Have one student write the “to” statement under the sentence strip based on the number of cubes.

4. Once all of the sentence strips have a “to” statement, ask the students how we could represent the comparison numerically (without the “to”). Allow students 1 to 2 minutes to talk with a partner or small group to identify the numeric representations.

5. Allow groups to post their responses under the correct Comparison Statement. As a class, discuss the responses.

6. Use this discussion to identify the big idea (or theme) for the representations – ratios.
   a. Ratios compare 2 quantities.
   b. The numbers in a ratio are terms.

7. Using the initial example (3 red to 8 blue cubes), ask students if the ratio of red cubes to blue cubes can be expressed as 8 blue cubes to 3 red cubes? As a class, discuss why this order is not correct and why is order important to ratios.

8. Referring to the Comparison Statements, ask students what is being compared? Guide the students to the understanding of comparing part to part and part to whole and whole to part.
Evidence of Success: What exactly do I expect students to be able to do by the end of the lesson, and how will I measure student mastery? That is, deliberate consideration of what performances will convince you (and any outside observer) that your students have developed a deepened (and conceptual) understanding.

1. Give each student a copy of the whole class ratio response cards (you may want to have the cut apart before use).
2. Tell students that you will be reading an example of a ratio and they need to identify the type of ratio using their response card.
   a. We planted 8 tulips and 24 daisies – identify the type of ratio. (part to part)
   b. It snowed 6 days out of 13 days in February. (part to whole)
   c. 5 out of 15 students got a B on the last quiz. (part to whole)
   d. Out of 16 soccer players, 8 scored a goal. (whole to part)
   e. I have 8 M&M’s that are all red. (Note: meaning 8 out of 8 are red) (whole to whole)
   f. There is one desk for every 2 students. (part to part)
   g. Out of 4 bedroom walls, Kathy painted 3 blue. (whole to part)

Notes and Nuances: Vocabulary, connections, common mistakes, typical misconceptions, etc.

Vocabulary: Comparison, Ratio term(s), Relationship, Ratio, Part to part, Part to whole, Whole to part, Whole to whole

Possible misconceptions: Students may not understand that the order of terms matters in a ratio statement.

Resources: What materials or resources are essential for students to successfully complete the lesson tasks or activities?

Bags (optional for cubes)
Rainbow Cubes or Katie Cubes
Lesson Launch handout
Comparison Statements for Sentence Strips:
   • Red to blue
   • White to orange
   • Red to total blocks
   • Total blocks to yellow
   • Blue and red to orange

Homework: Exactly what follow-up homework tasks, problems, and/or exercises will be assigned upon the completion of the lesson?

To be determined by teacher.

Lesson Reflections: What questions, connected to the lesson objectives and evidence of success, will you use to reflect on the effectiveness of this lesson?

Were students able to correctly identify the ratio relationship?
Using the 3-2-1 what did the students find challenging?
Whole Class – Ratio Response Cards

part to whole

part to part

whole to whole

whole to part