

# **UNIT 1: Comparing Bits & Pieces**

## **Grade 6 - Lessons Outline**

(Mid-September – Mid-October)

### **Inventory:**

- Poster Board
- Paper Strips 8.5" long
- Blank, Unfolded 8.5" Fraction Strips
- Rulers
- Unlined Paper
- Tenths, Hundredths, Thousandths, & Ten Thousandths Grids to Display and Shade
- Colored Pens, Pencils or Markers
- CM Grid Paper Transparencies (In Class & For Students to Take Home)
- Calculators
- Mathematical Practices Handouts (for student binders, in class & a poster or two hanging in the room)

### **On Walls or In Classroom:**

- Fraction Bar Display
- Fractions, Decimals, Percents Number Line/Thermometer Benchmarks Poster
- Vocabulary Word Wall – Interactive

### **REQUIREMENTS OUTSIDE OF THE PACING HERE...**

1. Need a period for the pre-assessment/readiness test.
2. Need  $\frac{1}{2}$  periods for 4 Mathematical Reflections/CC Performance Standards Writing Pieces
3. Need an additional  $\frac{1}{2}$  period for 3 Check-Ins (One Is a Partner Quiz – 2 Are Independent)
4. Need to weave in SKILLS PRACTICE within this unit, especially making equivalent fractions, finding common factors & multiples...
5. Need to weave in new vocabulary on word wall – and, in notebooks – as it appears in the module.

Investigation CMP3	Title	Guiding Question	Resources Needed	HW TO CHOOSE FROM
<i>Pacing is Estimated</i>		<b>CMP3 HAS NO COMPARABLE MATCH IN CMP2 Therefore, we are using the CMP 3 Unit Here</b>		<i>Resources found on-line – materials from Dr. Collins</i>
<b>PREASSESS</b> (1 Day)	<i>May use skills period for this?</i>		<ul style="list-style-type: none"> <li>• <b>UNIT READINESS ASSESSMENT</b></li> <li>• <b>Unit Readiness Assessment Report</b> – For file &amp; copy for student/parents</li> </ul>	Send home results; use to fill in skills practice needs.
<b>1.1</b> (1 Day)	Fundraising: Comparing Fractions w/ Ratios	<p>What are two ways to compare a \$500 fundraising goal to a \$200 fundraising goal?</p> <p><i>Part A is the HEART of this problem. Use it to assess knowledge of rational numbers, esp. equivalent fractions.</i></p> <p><i>GROUPING: Students work in pairs and then share their work with another pair.</i></p> <p><i>** Question C is an extension that is NOT necessary for all students to complete. Students can meet the goals of the Problem by completing questions A &amp; B.</i></p> <p><b>Key Vocabulary:</b> no new terms</p>	<ul style="list-style-type: none"> <li>• None</li> </ul>	<b>A:</b> 1-2 <b>C:</b> 35-40
<b>1.2</b> (1 Day)	Fundraising Thermometers: Introducing Ratios	<p>How does a “for every” statement show a ratio comparison?</p> <p><i>GROUPING: Students should work individually at first, then collaborate with partners or small groups.</i></p> <p><i>NOTE: You may want to summarize after A, and then launch the rest of the problem. Have students put work on easel paper to be used in the summarize. A, B part 2, and C are appropriate for this.</i></p> <p><b>Key Vocabulary:</b> ratio</p>	<ul style="list-style-type: none"> <li>• <b>LAUNCH VIDEO</b></li> <li>• <b>LAB 1.2</b> Fundraising Thermometers</li> <li>• poster board</li> </ul>	<b>A:</b> 3-4 <b>C:</b> 41-43 <b>E:</b> 65-70
<b>1.3*</b> (2 Days)	On the Line: Equivalent Fractions & The Number Line	<p>When you fold fraction strips, what relationships do you see emerge that show how the numerator and denominator change to make equivalent fractions?</p> <p><i>*In this problem, students make an important transition from thinking of fraction as a part-to-whole relationship to thinking of fraction as a number on the number line; they deepen their understanding of equivalent fractions.</i></p> <p><i>PACING: 2-DAY PROBLEM... Questions A &amp; B on Day 1; Questions C, D, And E on Day 2.</i></p>	<ul style="list-style-type: none"> <li>• <b>LAB 1.3A:</b> Blank # Line</li> <li>• <b>ACC LAB 1.3B:</b> Alternative to Blank Number Line (SpEd)</li> <li>• <b>Fraction Strips</b></li> <li>• <b>ACC LAB 1.3C:</b> Fraction Strips w/ Parts (SpEd)</li> <li>• <b>1ACE:</b> Exercise 52</li> </ul>	<b>A:</b> 5-18 <b>C:</b> 44-46 <b>C:</b> 52-53 (Use 1ACE 52) <b>C:</b> 55-64 <b>C:</b> 71-80 (Use 1ACE 71-74)

		<p><i>GROUPING: Students can work in groups of 2-4.</i></p> <p><b>Key Vocabulary:</b> <i>equivalent fractions</i></p>	<ul style="list-style-type: none"> <li>• <b>1ACE:</b> Exercises 75-80</li> <li>• <b>1ACE:</b> Exercises 71-74 (ACC)</li> <li>• <b>Paper Strips</b> – 8.5” Long</li> </ul>	
<b>1.4</b> (1 Day)	Measuring Progress: Finding Fractional Parts	<p>How can fraction strips help you to find part of a number?</p> <p><b>Key Vocabulary:</b> <i>no new terms</i></p>	<ul style="list-style-type: none"> <li>• <b>LAB 1.4:</b> Days 2, 4, 6, 8, 10 Thermometers</li> <li>• <b>Fraction Strips</b></li> <li>• Students’ Fractions Strips from Inv. 1.3</li> <li>• Extra Blank, Unfolded Fraction Strips</li> </ul>	<p><b>A:</b> 19-24 <b>C:</b> 47 <b>E:</b> 81</p>
<b>1.5</b> (1.5 Days)	Comparing Fundraising Goals: Using Fractions & Ratios	<p>What does it mean for two <b>fractions</b> to be equivalent? What does it mean for two <b>ratios</b> to be equivalent?</p> <p><i>NOTE: Students are explicitly wrestling for the first time with both fractions and ratios in the same problem. They explore the fundamental idea of equivalence as it applies to both ratios and fractions.</i></p> <p><b>Key Vocabulary:</b> <i>comparison statement, tape diagram</i></p>	<ul style="list-style-type: none"> <li>• <b>LAUNCH VIDEO</b></li> <li>• <b>LAB 1.5:</b> Day 10 Thermometers</li> <li>• <b>Unfolded 8.5” Fraction Strips</b></li> <li>• Extra blank, unfolded fraction strips</li> </ul>	<p><b>A:</b> 29-34 <b>C:</b> 48-51 <b>C:</b> 54 <b>E:</b> 82</p>
½ Day	<b>REFLECTIONS</b>		<b>Mathematical Reflections &amp; CC Math Practices</b> (p.97-98 CMP3)	
1 Day	<b>ASSESSMENT</b>	<b>PARTNER QUIZ</b>	<ul style="list-style-type: none"> <li>• <b>Copies of Quiz</b></li> <li>• Think ahead about partners, esp. if odd-number in class.</li> </ul>	

Investigation CMP3	Title	Guiding Question	Resources Needed	HW TO CHOOSE FROM
<b>2.1</b> (1 Day)	Equal Shares: Introducing Unit Rates	<p>What does a unit rate comparison statement tell us?</p> <p><i>GROUPING: Students work in pairs and then share their work with another pair. Use easel paper for work to use in the Summarize. Do a gallery walk at the beginning of the Summarize and have students leave a sticky-note question or comment on the posters.</i></p> <p><b>Key Vocabulary:</b> unit rate</p>	<ul style="list-style-type: none"> <li>Easel Paper for Responses/Gallery Walk</li> <li>Sticky Notes for Comments</li> </ul>	<p><b>A:</b> 1-6 <b>C:</b> 25-26 <b>E:</b> 31-33</p>
<b>2.2</b> (1 Day)	Unequal Shares: Using Ratios and Fractions	<p>How are <i>part-to-part</i> ratio relationships related to <i>part-to-whole</i> fractions?</p> <p><i>GROUPING: Students can work in groups of 2-4. Have students put work on easel paper to use in the Summarize.</i></p> <p><b>Key Vocabulary:</b> no new terms</p>	<ul style="list-style-type: none"> <li><b>LAUNCH VIDEO</b></li> <li><b>LAB 2.2:</b> Fraction Strips</li> </ul>	<p><b>A:</b> 7-15 <b>C:</b> 27-28 <b>E:</b> 34-35</p>
<b>2.3</b> (1 Day)	Making Comparisons w/ Rate Tables	<p>How do rate tables help us find equivalent ratios?</p> <p><i>GROUPING: Students work in small groups. Have students put work on easel paper to use in the Summarize.</i></p> <p><b>Key Vocabulary:</b> rate table</p>	<ul style="list-style-type: none"> <li><b>LAB 2.3:</b> Making Comparisons</li> <li>Easel Paper: Student put work here to use in Summarize</li> </ul>	<p><b>A:</b> 16-24 <b>C:</b> 29-30 <b>E:</b> 36-37</p>
(1/2 Day)	<b>MATHEMATICAL REFLECTIONS</b>		<ul style="list-style-type: none"> <li><b>Mathematical Reflections &amp; CC Math Practices</b> (p.59/60)</li> </ul>	
(1/2 Day)	<b>Assessment: Check-Up</b>		<ul style="list-style-type: none"> <li><b>CHECK-UP 1</b></li> </ul>	

Investigation CMP3	Title	Guiding Question	Resources Needed	HW TO CHOOSE FROM
<p><b>3.1</b> (1.5 Days)</p>	<p>Extending the Number Line: Integers &amp; Mixed Numbers</p>	<p>How can the number line help you think about fractions greater than 1 and less than 0?</p> <p><i>GROUPING: Students should work in pairs. Lab 3.1 is provided for the students to label blank number lines.</i></p> <p><i>NOTE: This is a 1-1/2 or 2 day problem. Possibly divide the Problem into and the Problem into parts... DAY 1: Parts A-C – including text about mixed #s, #s less than zero and greater than 1, and opposites. DAY 2: Parts D and E including the text about absolute value and rational numbers.</i></p> <p><b>Key Vocabulary:</b> absolute value, mixed number, rational numbers, improper fraction, opposites</p>	<ul style="list-style-type: none"> <li>• <b>LAB 3.1:</b> Place Fractions on a # Line (Accessibility)</li> <li>• <b>LAB 3ACE:</b> Ex. 4 (Access.)</li> <li>• <b>Rulers</b></li> <li>• <b>Unlined Paper</b></li> </ul>	<p><b>A:</b> 1-15 (<b>LAB3ACE 4</b>) <b>A:</b> 20-22 <b>A:</b> 24 <b>C:</b> 89-91 <b>E:</b> 36-37</p>
<p><b>3.2</b> (1 Day)</p>	<p>Estimating &amp; Ordering Rational Numbers: Comparing Fractions to Benchmarks</p>	<p>When comparing two rational numbers, what are some useful strategies for deciding which is greater?</p> <p><i>GROUPING: Students should think-pair-share for this problem.</i></p> <p><i>NOTES: LAB 3.2A is for each student to cut apart the fractions and sort them in the table on LAB 3.2B.</i></p> <p><b>Key Vocabulary:</b> benchmark</p>	<ul style="list-style-type: none"> <li>• <b>LAB 3.2A:</b> Fraction Benchmarks</li> <li>• <b>LAB 3.2B:</b> Fraction Benchmarks</li> <li>• <b>Rulers</b></li> <li>• <b>Unlined Paper</b></li> </ul>	<p><b>A:</b> 16-19 <b>A:</b> 23 <b>A:</b> 25-52 <b>E:</b> 94-96 <b>E:</b> 98-99</p>
<p><b>3.3</b> (1 Day)</p>	<p>Sharing 100 Things: Using Tenths &amp; Hundredths</p>	<p>How does what you know about fractions help you understand decimals</p> <p><i>GROUPING: Students work in small groups.</i></p> <p><i>NOTE: LAB 3.3A is provided to help students work through the question in the INTRO. LAB 3.3B and LAB 3.3C contain grids – to help students save time rather than drawing their own.</i></p> <p><b>Key Vocabulary:</b> benchmark</p>	<ul style="list-style-type: none"> <li>• <b>LAB 3.3A:</b> Fractions on a Grid (Access.)</li> <li>• <b>LAB 3.3B:</b> Rep. Fractions on a Grid (Access.)</li> <li>• <b>LAB 3.3C:</b> 10ths, 100ths, 1000ths Grids (Access.)</li> <li>• <b>LAB 3ACE:</b> Ex. 66-68 (Access.)</li> </ul>	<p><b>A:</b> 53-69 (<b>LAB3ACE66-68</b>) <b>C:</b> 93</p>

<p><b>3.4</b> (2 Days)</p>	<p>Decimals on the Number Line</p>	<p>How do we use what we know about fractions to estimate and compare decimals?</p> <p><i>GROUPING: Students should think-pair-share for this problem.</i></p> <p><i>PACING: Most likely a 2-Day Problem. Day one could be parts A-C &amp; Day 2 could be parts D-F of the problem.</i></p> <p><b>Key Vocabulary:</b> no new terms</p>	<ul style="list-style-type: none"> <li>• <b>LAB 3.3C:</b> Repartitioning Number Lines</li> <li>• <b>LAB 3ACE:</b> Ex 73-76</li> </ul>	<p><b>A:</b> 70-84 (<b>LAB3ACE 73-76</b>) <b>E:</b> 97</p>
<p><b>3.5</b> (1 Day)</p>	<p>Earthquake Relief: Moving From Fractions to Decimals</p>	<p>Why does it make sense to divide the numerator of a fraction by the denominator to find an equivalent decimal representation?</p> <p><i>GROUPING: Students should work with partners or in small groups.</i></p> <p><i>TECHNOLOGY: Students may use a calculator for the division exercises that result in a repeating decimal.</i></p> <p><b>Key Vocabulary:</b> no new terms</p>	<ul style="list-style-type: none"> <li>• Calculators (<i>optional</i>)</li> </ul>	<p><b>A:</b> 85-87 <b>C:</b> 92 <b>E:</b> 100-105</p>
<p>(1/2 Day)</p>	<p><b>REFLECTIONS</b></p>	<p><b>Mathematical Reflections</b></p>	<p><b>Mathematical Reflections &amp; CC Math Practices</b> (pp.93-94 Student Manual)</p>	<p><b>Study for Quiz</b></p>
<p>(1/2 Day)</p>	<p><b>ASSESSMENT</b></p>	<p><b>PARTNER QUIZ</b></p>		

Investigation CMP3	Title	Guiding Question	Resources Needed	HW TO CHOOSE FROM
<b>4.1</b> (1 Day)	Who Is the Best? Making Sense of Percents	<p>How is a percent bar useful in making comparisons with decimals?</p> <p><i>GROUPING: Students work in pairs on this problem.</i></p> <p><i>NOTES: LAB 4.1 contains percent bars for A &amp; B. This will help students focus on the math rather than having them draw their own.</i></p> <p><b>Key Vocabulary:</b> percent</p>	<ul style="list-style-type: none"> <li>• <b>LAUNCH VIDEO</b></li> <li>• <b>LAB 4.1:</b> Making Sense of Percents (1 Per Pair)</li> </ul>	<p><b>A:</b> 1-5 <b>A:</b> 20</p> <p><b>C:</b> 26-31</p> <p><b>E:</b> 34-39</p>
<b>4.2</b> (1 Day)	Genetic Traits: Finding Percents	<p>How can partitioning be used to express one number as a percent of another number.</p> <p><i>GROUPING: Students can work in partners or small groups.</i></p> <p><i>NOTES: Use LAB 4.2 to support Question A. Students will save time by not having to copy the table.</i></p> <p><b>Key Vocabulary:</b> no new terms (perhaps review "partitioning")</p>	<ul style="list-style-type: none"> <li>• <b>LAB 4.2:</b> Genetic Traits</li> <li>• <b>LAB 4ACE 15-16</b></li> </ul>	<p><b>A:</b> 6-19 (<i>LAB 4ACE 15-16</i>)</p> <p><b>C:</b> 32-33</p> <p><b>E:</b> 40</p>
<b>4.3</b> (1 Day)	The Art of Comparison: Using Ratios & Percents	<p>In what way is a percent like a ratio and like a fraction?</p> <p><i>GROUPING: Students can work in pairs.</i></p> <p><i>NOTES: LAB 4.3 has a reproduction of the image in Question A. This can be given to students to help work out their thinking on the image.</i></p> <p><b>Key Vocabulary:</b> no new terms</p>	<ul style="list-style-type: none"> <li>• <b>LAB 4.3:</b> 50/50 Art Exhibit</li> <li>• <b>TEACH AID 4.3:</b> 50/50 Art Exhibit</li> </ul>	<p><b>A:</b> 21-25</p> <p><b>E:</b> 41-44</p>
½ Day	<b>REFLECTIONS</b>		<b>Mathematical Reflections &amp; CC Math Practices</b> (p.260 CMP3 TE)	<b>UNIT TEST!!!!</b>
½ Day	<b>LOOKING BACK &amp; LOOKING AHEAD</b>		<b>Check-Up 1 to Review</b>	

TAKE HOME	ASSESSMENT	SELF-ASSESSMENT	<ul style="list-style-type: none"> <li>• Self-Assessment Sheets</li> <li>• Notebook Checklist</li> </ul>	TAKE HOME to compete and study for test.
1 Day	<b>UNIT TEST</b>		<ul style="list-style-type: none"> <li>• Unit Test Copies</li> </ul>	

### UNIT VOCABULARY:

- absolute value
- benchmarks
- equivalent fractions
- improper fraction
- mixed number
- opposites
- percent
- rate table
- ratio
- rational numbers
- unit rate

### REFLECTING ON STUDENT LEARNING:

*Use the following questions to assess student understanding at the end of each lesson.*

- What evidence do I have that students understand the Focus Question?
  - Where did my students get stuck?
  - What strategies did they use?
  - What breakthroughs did my students have today?
- How will I use this information to plan for tomorrow? For the next time I teach this lesson?
- Where will I have the opportunity to reinforce these ideas as I continue through this unit? The next unit?

*There is no unit project for this unit. Do we want a standards based performance assessment or is the reflection and unit test rich enough to extract evidence of deeper thinking and application of the materials learned?*