

UNIT PLAN - COMPARING & ORDERING FRACTIONS

	<p><u>Unit Topic & Guiding Questions:</u></p> <p>Math Grade 5 - Comparing & ordering fractions - How can you prove one fraction is greater than, less than, or equal to another when they have different numerators and/or denominators?</p> <p>Math Grade 6 - Comparing fractions & mixed numbers - What are the connections between fractions and mixed numbers? How can you compare and order them?</p>
	<p><u>Rationale:</u></p> <p>In this unit, students will be introduced to, and work toward mastery of, estimating and comparing fractions using benchmarks. Benchmarks are a known size or amount that helps us understand a different size or amount. The “Benchmark Strategy” is useful for estimating and comparing fractions that have different numerators and/or denominators because it eliminates the need to find a common denominator and multiply (which can be challenging for learners at this age and stage in their learning). Instead, students are encouraged to use models and visual aids (area models, fraction strips, fraction circles, or a number line) to estimate & compare fractions using benchmarks (zero, half, and a whole).</p>

STAGE 1: Desired Results

		Big Ideas →	Essential Questions
UNDERSTAND		<p>Numbers describe quantities that can be represented by fractions.</p> <p>Mixed numbers represent quantities that can be decomposed into parts and wholes.</p>	<p>How can you prove one fraction is greater than, less than, or equal to another when they have different numerators and/or denominators?</p> <p>What are the connections between fractions and mixed numbers? How can you compare and order them?</p>
DO	<p>Core Competencies:</p> <div style="display: flex; justify-content: space-between;"> <div style="width: 30%;"> <p> Communication</p> <p><input type="checkbox"/> Communicating</p> <p>I can communicate purposefully, using forms and strategies I have practiced. I can share my ideas and try to connect them with others' ideas.</p> <p>Students will be active listeners, make connections, and ask clarifying and extending questions when</p> </div> <div style="width: 30%;"> <p> Thinking</p> <p><input type="checkbox"/> Critical and Reflective Thinking</p> <p>I can use evidence to make simple judgments.</p> <p>Students will make predictions, ask questions, use their senses to gather information, and make judgments based on the evidence they receive in lessons and activities.</p> <p>Students will engage in mathematical inquiry,</p> </div> <div style="width: 30%;"> <p> Personal & Social</p> </div> </div>		

appropriate. Students will share their ideas and try to connect them to others' ideas. Students will represent mathematical ideas and concepts in concrete, pictorial, and symbolic forms.

Collaborating

I can contribute during group activities with peers and share roles and responsibilities to achieve goals.

Students will contribute and express their ideas and help others feel comfortable to share theirs so that all voices are included. Students will work with others to achieve a common goal. Students will collaborate with a partner to practice and understand estimating and comparing fractions using benchmarks (i.e. during the Think-Pair-Share Activity).

identifying and investigating fractions and benchmarks. Students will explore with purpose and use the Benchmark Strategy to estimate and compare fractions. Students will explore the possibilities that open up when they use benchmarks and reflect on the process.

Students will apply critical, metacognitive, and reflective thinking in applying the Benchmark Strategy, and will relate this thinking to other experiences, using this process to identify ways to improve or adapt their approach to learning.

Students will reflect on and assess their experiences, thinking, learning process, work, and progress in using benchmarks to estimate & compare fractions.

Learning Standards - Curricular Competencies:

During this unit, students will participate in large and small group discussions and activities, as well perform independent work. This will require:

1. Reasoning and analyzing

- Use reasoning to explore and make connections.
- Estimate reasonably.
- Develop mental math strategies and abilities to make sense of quantities.
- Use technology to explore mathematics.
- Model mathematics in contextualized experiences.

2. Understanding and solving

- Develop, demonstrate, and apply mathematical understanding through play, inquiry, and problem-solving.
- Visualize to explore mathematical concepts.
- Develop and use multiple strategies to engage in problem solving.

3. Communicating and representing

- Communicate mathematical thinking in many ways.
- Use mathematical vocabulary and language to contribute to mathematical discussions.
- Explain and justify mathematical ideas and decisions.
- Represent mathematical ideas in concrete, pictorial, and symbolic forms.

4. Connecting and reflecting

- Reflect on mathematical thinking.
- Connect mathematical concepts to each other and to other areas and personal interests.

	KNOW	<p><u>Learning Standards - Content:</u></p> <p>Before starting this unit, students will know that fractions are numerical quantities that represent parts of a whole, each with a denominator indicating the number of equal parts that make up the whole, and a numerator indicating the number of equal parts used or taken from the whole. They will also know how to compare fractions with common numerators and common denominators.</p> <p>After this unit, students are expected to know:</p> <ul style="list-style-type: none"> ● Whole number and fraction benchmarks <ul style="list-style-type: none"> ○ How to estimate and compare fractions with uncommon numerators and denominators using benchmarks. ○ That two equivalent fractions are two ways to represent the same amount (having the same whole). ● Improper fractions and mixed numbers <ul style="list-style-type: none"> ○ How to use benchmarks, number lines, and common denominators to compare and order, including whole numbers. ○ How to use fractions strips, fraction circles, and grids. 	
	First Peoples Principles of Learning	<ul style="list-style-type: none"> <input type="checkbox"/> <i>Learning ultimately supports the well-being of the self, the family, the community, the land, the spirits, and the ancestors.</i> <input type="checkbox"/> <i>Learning is holistic, reflexive, reflective, experiential, and relational (focused on connectedness, on reciprocal relationships, and a sense of place).</i> <input type="checkbox"/> <i>Learning involves recognizing the consequences of one's actions.</i> <input type="checkbox"/> <i>Learning involves generational roles and responsibilities.</i> <input type="checkbox"/> <i>Learning recognizes the role of indigenous knowledge.</i> <input type="checkbox"/> <i>Learning is embedded in memory, history, and story.</i> <input type="checkbox"/> <i>Learning involves patience and time.</i> <input type="checkbox"/> <i>Learning requires exploration of one's identity.</i> <input type="checkbox"/> <i>Learning involves recognizing that some knowledge is sacred and only shared with permission and/or in certain situations.</i> 	<p><u>Addressing the FPPL:</u></p> <p>During lessons, students are encouraged to be patient and kind to themselves and each other as they learn new concepts.</p> <p>Lessons will be delivered via open, non-judgmental group discussions, built upon positive teacher/student and student/student relationships and connections. Ideas and concepts will be learned experientially, through a mixture of explicit instruction, modeling, scaffolded support, practice, and student-doing.</p>

STAGE 2: Assessment Plan

Formative Assessment (Assessment as Learning and Assessment for Learning):

During the formative learning stage in this unit, students will demonstrate their learning and understanding of estimating and comparing fractions using benchmarks several ways:

1. By engaging in the classroom discussions, and with the explanatory videos.
2. By participating in the whole-class number line model/activity.
3. By working collaboratively to solve the task cards in the Think-Pair-Share activity.
4. By contributing to the whole class “Benchmark Fractions” digital sort.
5. By solving word problems independently during whiteboard practice.
6. By self-assessing their understanding in thumbs up/down polls.

Throughout the unit, students will have ample opportunity to practice, gain formative feedback, and receive extra support as they work toward mastery of the concept.

Summative Assessment (Assessment of Learning):

Toward the end of the unit, students will complete a pencil-to-paper task (i.e. a work booklet) that will be handed in for summative assessment.





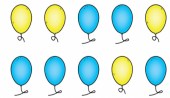

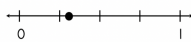
The teacher will then review and provide feedback to students on where they are in their learning.

Instruction can be adjusted, with the teacher reviewing and/or re-teaching when necessary, to whomever necessary.

Students are expected to complete corrections in their booklets before moving on to the next unit in this learning sequence.

Stage 3: Learning Plan

Lesson/ Date	Learning Intentions	Instructional Activities (brief description here - lesson plans will be used to flesh out each lesson)
Lesson 1 Feb 6	Review prior knowledge Introduce the "Benchmark Strategy" and give students a chance to explore the strategy as a class (whole group activity), as well as in small groups (Think-Pair-Share).	<p>First, students will be introduced to the Benchmark strategy, watch an explanatory video, and discuss the strategy's usefulness.</p> <div data-bbox="1129 397 1686 711" data-label="Image"> </div> <p>https://www.youtube.com/watch?v=KtM8x_R5MNg</p> <p>Second, students will participate in a whole-class activity where they will create a model of a number line (i.e. stretch a long piece of string across the front of the classroom and clip on benchmarks 0, $\frac{1}{2}$, and 1). Then, each student will get a different fraction card, which they will clip on the number line according to where they think it goes relative to the benchmarks (i.e. is it closest to 0, $\frac{1}{2}$ or 1?). Once all students' cards have been clipped, we will move along the number line and discuss each card's positioning—adjusting, reasoning, and moving as needed.</p> <div data-bbox="966 1052 1850 1193" data-label="Image"> </div> <p>Third, students will pair up with a partner (or two) to do a Think-Pair-Share activity. Each pair/group will get a whiteboard, a dry-erase marker, and an eraser, and will have to work together to answer a set of questions (i.e. Task Cards), which will be displayed on the Smartboard. The class will come back together, and groups will share and discuss their answers.</p> <p>Further Task Cards can be displayed on the Smartboard and completed if time permits.</p>

		<p>Benchmark Fractions</p> <p>Which fraction is closest to $\frac{1}{2}$, but not equal to $\frac{1}{2}$?</p> <p>A.  B.  C.  D. </p> <p>5</p>	<p>Benchmark Fractions</p> <p>Which fraction is closest to $\frac{1}{2}$, but not less than or equal to $\frac{1}{2}$?</p> <p>A. $\frac{2}{5}$ B. $\frac{5}{9}$ C. $\frac{3}{11}$ D. $\frac{6}{12}$</p> <p>6</p>	<p>Benchmark Fractions</p> <p>Look at the fraction of the balloons that are yellow. Is that fraction closest to 0, $\frac{1}{2}$, or 1?</p>  <p>1</p>	<p>Benchmark Fractions</p> <p>Is the fraction below closest to 0, $\frac{1}{2}$, or 1?</p>  <p>2</p>
		<p>Benchmark Fractions</p> <p>Which fraction is closest to 1, but not greater than 1?</p> <p>A. $\frac{1}{6}$ B. $\frac{5}{8}$ C. $\frac{3}{10}$ D. $\frac{13}{12}$</p> <p>7</p>	<p>Benchmark Fractions</p> <p>Which fraction is closest to 1?</p> <p>A. $\frac{1}{3}$ B. $\frac{7}{8}$ C. $\frac{4}{10}$ D. $\frac{10}{10}$</p> <p>8</p>	<p>Benchmark Fractions</p> <p>Is the fraction below closest to 0, $\frac{1}{2}$, or 1?</p>  <p>3</p>	<p>Benchmark Fractions</p> <p>$2/11$ is closest to:</p> <p>A. 0 B. $\frac{1}{2}$ C. 1</p> <p>4</p>

Lesson 2
Feb 7

Practicing the "Benchmark Strategy"

- Task Cards
- Flash Cards (retrieval practice)
- Low Stakes Game

Complete the Task Cards from last lesson: students to get back into their groups and finish the Think-Pair-Share activity. Each pair/group will get a whiteboard, a dry-erase marker, and an eraser, and will work together to answer the remaining questions (i.e. Task Cards), which will be displayed on the Smartboard. The class will come back together, and groups will share and discuss their answers.

<p>Benchmark Fractions</p> <p>Which answer shows the benchmark numbers that will help you compare $\frac{1}{2}$ and $\frac{2}{3}$?</p> <p>A. $0 < \frac{1}{2}$ B. $\frac{1}{2} = \frac{1}{2}$ C. $1 > \frac{1}{2}$ D. $0 < 1$</p> <p>9</p>	<p>Benchmark Fractions</p> <p>Which number goes in the box to make the statement true?</p> <p>$\frac{3}{6} < \frac{\square}{8}$</p> <p>A. 2 B. 3 C. 4 D. 5</p> <p>10</p>	<p>Benchmark Fractions</p> <p>Use benchmarks to compare the fractions.</p> <p>$\frac{3}{5} \square \frac{4}{11}$</p> <p>What symbol belongs in the box? Choose $<$, $>$, or $=$.</p> <p>13</p>	<p>Benchmark Fractions</p> <p>Use benchmarks to order these fractions from least to greatest.</p> <p>A. $\frac{2}{4}, \frac{1}{3}, \frac{6}{10}$ B. $\frac{6}{10}, \frac{2}{4}, \frac{1}{3}$ C. $\frac{1}{3}, \frac{6}{10}, \frac{2}{4}$ D. $\frac{1}{3}, \frac{2}{4}, \frac{6}{10}$</p> <p>14</p>
<p>Benchmark Fractions</p> <p>Which answer shows the benchmark numbers that will help you compare $\frac{3}{8}$ and $\frac{2}{3}$?</p> <p>A. $0 < 1$ B. $\frac{1}{2} > 0$ C. $\frac{1}{2} < 1$ D. $1 = 1$</p> <p>11</p>	<p>Benchmark Fractions</p> <p>Which number goes in the box to make the statement true?</p> <p>$\frac{10}{11} < \frac{\square}{7}$</p> <p>A. 0 B. 4 C. 5 D. 7</p> <p>12</p>	<p>Benchmark Fractions</p> <p>Use benchmarks to compare the fractions.</p> <p>$\frac{5}{12} \square \frac{4}{7}$</p> <p>What symbol belongs in the box? Choose $<$, $>$, or $=$.</p> <p>15</p>	<p>Benchmark Fractions</p> <p>Use benchmarks to order these fractions from least to greatest.</p> <p>A. $\frac{2}{3}, \frac{3}{12}, \frac{7}{4}$ B. $\frac{7}{4}, \frac{2}{3}, \frac{3}{12}$ C. $\frac{3}{12}, \frac{2}{3}, \frac{7}{4}$ D. $\frac{3}{12}, \frac{7}{4}, \frac{2}{3}$</p> <p>16</p>

Students will then work in the same (or different groups if the group dynamics need to be adjusted) to continue practicing the Benchmark Strategy using "Benchmark Flash Cards" and other than the "Comparing Fractions Game."

Lesson 3

Review & further practice

Feb 8

First, students will review what was covered in the first block (by way of 1-2 short videos).

[Compare fractions using the benchmark fraction 1/2](#)

How do you compare fractions using a benchmark like one whole?

$$\frac{5}{6} \quad ? \quad \frac{4}{3}$$

LEARN  ZILLION

[Compare fractions using the benchmark of one whole](#)

How do you compare fractions using a benchmark like one whole?

$$\frac{5}{6} \quad ? \quad \frac{4}{3}$$

LEARN  ZILLION

Second, students will work together to complete a whole class “Benchmark Fractions” digital sort, which will be displayed on the Smartboard.

Benchmark Fractions

Closest to 0	Closest to 1/2	Closest to 1

$\frac{17}{20}$

$\frac{2}{8}$

$\frac{3}{6}$

$\frac{4}{5}$

$\frac{9}{11}$

$\frac{26}{50}$

$\frac{1}{9}$

$\frac{7}{12}$

$\frac{12}{14}$

$\frac{7}{40}$

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Third, students will use whiteboards to solve two different word problems, holding up their answers when they think they have them right.

Kelly brought in a bunch of grapes and shared them with her friends. Daniel ate $\frac{5}{10}$ of his grapes. Marlon ate $\frac{6}{6}$ of his grapes. LeBron ate $\frac{1}{3}$ of his grapes. Bonnie ate $\frac{3}{4}$ of her grapes and Eli ate $\frac{2}{5}$ of his grapes. Who has eaten almost half of their grapes? Who has eaten close to none? Who ate close to all their grapes? Justify your answer.

Mr. Chandra was checking to see how many math questions his students had finished. Adam completed $\frac{2}{9}$, Sarah $\frac{5}{6}$, Timothy $\frac{1}{10}$, Lauren $\frac{5}{8}$, and Sally $\frac{3}{7}$. Who completed about half of their questions? Who has finished almost all of their work? Who has completed almost none? Justify your answer.

Lesson 4
Feb 9

Solidify learning via summative task

Students will complete a booklet that will allow them to show their understanding and solidify the learning intentions. Early finishers can play the "Comparing Fractions Game."

COMPARING FRACTIONS GAME

Directions: Spin the spinner one time. Write your fraction in the first row of the chart. Then, your partner takes a turn. Write the fraction he/she gets in the chart. Use benchmarks (0, 1/2, 1) to compare your fractions. Whoever has the bigger fraction wins the round! Keep playing until you complete the chart.

PICK YOUR FRACTION

MY FRACTION	<, >, OR =	MY PARTNER'S FRACTION

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Resources needed/Required Preparation:

Purchase and download the following supplemental resources, which are used in this unit:

Alyssa teaches. Benchmark Fractions Bundle. TpT. <https://www.teacherspayteachers.com/Product/Benchmark-Fractions-Bundle-4395187>

Teaching Through Rose Colored Glasses. It's a Chore to Work With Fractions. TpT. <https://www.teacherspayteachers.com/Product/6NS7-a-clothesline-fraction-ordering-activity-1136756>

For Lesson 1 and 2:

- Open the following video and have it ready to display on the Smartboard (starting at 0:22): [Benchmark Fraction Comparisons](#)
- Buy or collect a long piece of string and enough clothespins/clips to complete the number line model.
- Print, cut, and label enough fraction cards from "It's a Chore to Work With Fractions. TpT <https://www.teacherspayteachers.com/Product/6NS7-a-clothesline-fraction-ordering-activity-1136756>
- Open "Using Benchmarks to Compare Fractions: TASK CARDS." (Alyssa teaches' Benchmark Fractions Bundle. TpT) and have ready/oriented to display on the Smartboard (for Think-Pair-Share activity).
- Ensure that there are enough whiteboards, dry erase markers, and erasers for the Think-Pair-Share activity.

	<p>For Lesson 3:</p> <ul style="list-style-type: none"> ● Open the following videos and have them ready to display on the Smartboard: Compare fractions using the benchmark fraction 1/2 Compare fractions using the benchmark of one whole ● Open "Print & Digital Sort: Benchmark Fractions" (Alyssa teaches' Benchmark Fractions Bundle. TpT) and then click the link to open the Google Slide containing the digital sort. Have ready for whole-class activity. ● Have word problems ready to display for independent whiteboard practice <p>For Lesson 4:</p> <ul style="list-style-type: none"> ● Open "Benchmark Fractions: Poster & Printables" (Alyssa teaches' Benchmark Fractions Bundle. TpT) and have it ready to show on the Smartboard. ● Print/Photocopy booklets (double sided) - pages 3-8 of "Benchmark Fractions: Poster & Printables." ● Print the booklet's answer key for marking - pages 9-12 of "Benchmark Fractions: Poster & Printables."
	<p>Interdisciplinary connections: (e.g. How did you weave ELA, Social Studies, Science, Math, Fine Arts, and/or ADST together in this instructional sequence?)</p>
	<p>An effort was made to incorporate technology (ADST).</p>
	<p>Reflection:</p>
	<p><u>How did the unit go? How do I know?</u> This short unit went really well and I will absolutely do it again. The students thoroughly enjoyed the hands-on-activities that got them up and moving from their desks. The clothesline activity, which was a model representation of a number line, helped the class visualize and order fractions using the Benchmark Strategy, all the while working as a collective to ensure accurate placement of each fraction card. Drawing upon teamwork, and with me there talking them through the trickier fractions, the students were able to complete the task successfully! The digital sort was the second activity that got students up and out of their desks, coming up to the front of the Smartboard to drag fractions into one of three columns (closest to 0, closest to $\frac{1}{2}$, or closest to 1). This required bravery and confidence, but with my support even the shy students to participated 😊 The task card activity was another big hit as the students enjoy working in small groups and putting their brains together to solve problems while being social. I was pleasantly surprised that all groups were on task, participating. Early finishers worked on flashcards between each set of four task cards and this gave them something to do while they</p>

waited for slower groups to catch up. We discussed the answers between each set of four and the sixteen cards were just the right amount (i.e. no one got bored or started getting off task).

The class/group activities built up student confidence for the independent whiteboard practice and work booklet, so much so that the two additional videos suggested in lesson three were not utilized. This allowed us to move to the booklet and complete in on day three, with only a few students needing to finish it during that day's flex block. Most students were able to complete the booklet without support from the teacher. Of course, there were a few students that needed guidance and struggled in their understanding; these students either relied on teacher support or their table partner for help. As such, I felt like more was required to gauge individual student understanding before moving on in the learning sequence. Plus, we were ahead of the game so day four was delegated to a low-stakes quiz. Below is the two-page quiz I created using a selection of the fraction flashcard questions and the fraction task card questions. I chose these questions because students were accustomed to the wording and types of problems to be solved. The majority of the students were extremely successful (scoring anywhere from 13-16 out of 16, with only a few students scoring less than 12).

Benchmark Fractions Quiz

Name: _____

<p>Q: Is the fraction below closest to 0, 1/2, or 1?</p> <p style="text-align: center;">$\frac{5}{6}$</p>	<p>Q: Which fraction is closest to 0?</p> <p style="text-align: center;">$\frac{3}{12}$ $\frac{1}{2}$</p>
<p>Q: Is the fraction below closest to 0, 1/2, or 1?</p> <p style="text-align: center;">$\frac{2}{9}$</p>	<p>Q: Which fraction is closest to 1?</p> <p style="text-align: center;">$\frac{4}{5}$ $\frac{6}{10}$</p>
<p>Q: Is the fraction below closest to 0, 1/2, or 1?</p> <p style="text-align: center;">$\frac{9}{11}$</p>	<p>Q: Which fraction is closest to 1/2?</p> <p style="text-align: center;">$\frac{8}{10}$ $\frac{3}{8}$</p>
<p>Q: Is the fraction below closest to 0, 1/2, or 1?</p> <p style="text-align: center;">$\frac{5}{12}$</p>	<p>Q: Which fraction is closest to 1/2?</p> <p style="text-align: center;">$\frac{2}{6}$ $\frac{2}{9}$</p>
<p>Q: Is the fraction below closest to 0, 1/2, or 1?</p> <p style="text-align: center;">$\frac{4}{7}$</p>	<p>Q: Which fraction is closest to 1?</p> <p style="text-align: center;">$\frac{6}{7}$ $\frac{4}{4}$</p>

Benchmark Fractions Quiz

Name: _____

Which number goes in the box to make the statement true?

$$\frac{10}{11} < \frac{\square}{7}$$

- A. 0 C. 5
B. 4 D. 7

Which number goes in the box to make the statement true?

$$\frac{3}{6} < \frac{\square}{8}$$

- A. 2 C. 4
B. 3 D. 5

Use benchmarks to compare the fractions.

$$\frac{3}{5} \square \frac{4}{11}$$

What symbol belongs in the box?
Choose <, >, or =.

Use benchmarks to compare the fractions.

$$\frac{5}{12} \square \frac{4}{7}$$

What symbol belongs in the box?
Choose <, >, or =.

Use benchmarks to order these fractions from least to greatest.

- A. $\frac{2}{4}$, $\frac{1}{3}$, $\frac{6}{10}$ C. $\frac{1}{3}$, $\frac{6}{10}$, $\frac{2}{4}$
B. $\frac{6}{10}$, $\frac{2}{4}$, $\frac{1}{3}$ D. $\frac{1}{3}$, $\frac{2}{4}$, $\frac{6}{10}$

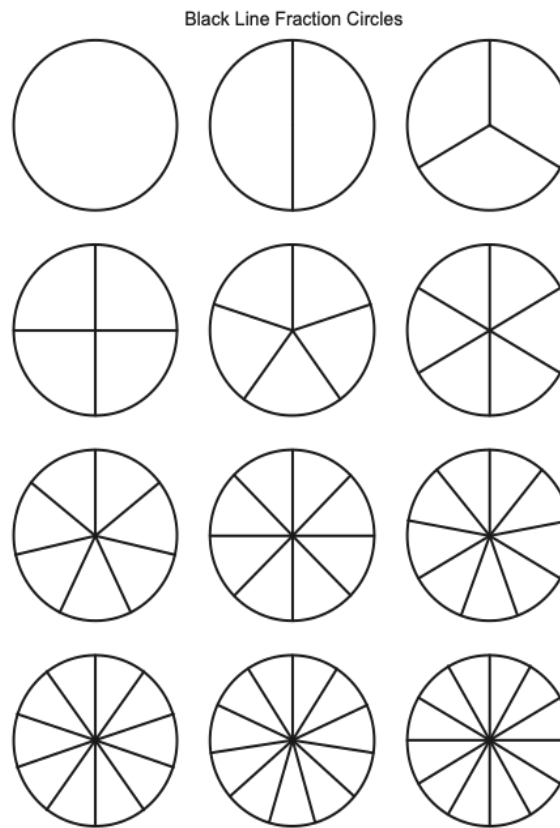
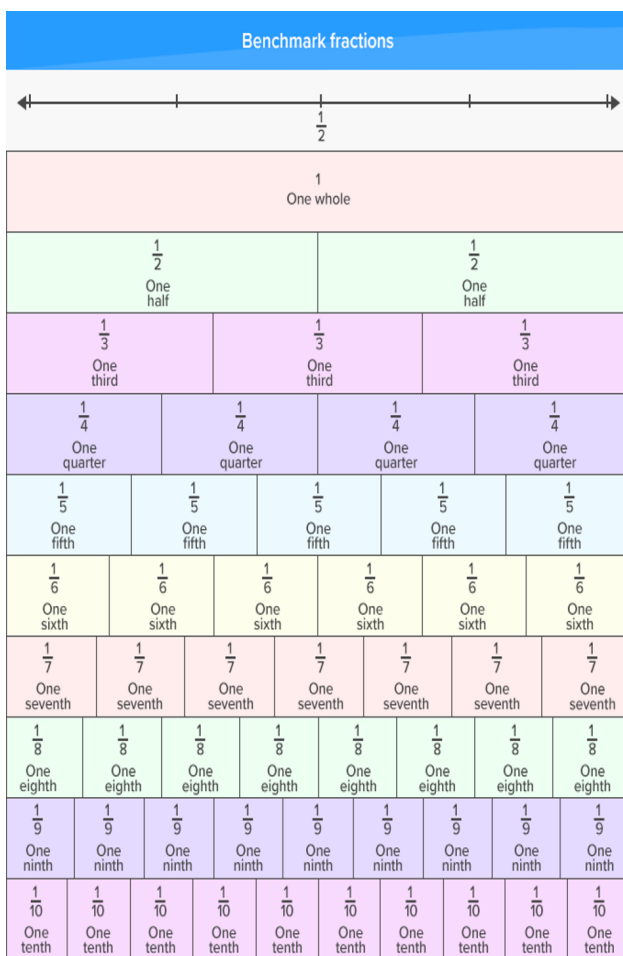
Use benchmarks to order these fractions from least to greatest.

- A. $\frac{2}{5}$, $\frac{3}{12}$, $\frac{7}{4}$ C. $\frac{3}{12}$, $\frac{2}{5}$, $\frac{7}{4}$
B. $\frac{7}{4}$, $\frac{2}{5}$, $\frac{3}{12}$ D. $\frac{3}{12}$, $\frac{7}{4}$, $\frac{2}{5}$

Where to next?

With the knowledge I gained from formally observing the hands-on and group activities, and from summatively assessing the work booklet and quiz, I know that the majority of the students are ready to move on to more difficult fraction work (ordering and comparing fractions by finding a common denominator and then multiplying or dividing, making equivalent fractions by simplifying, going from improper fraction to proper fraction and vice versa, adding/subtracting fractions, multiplying and dividing fractions, and eventually working with fractions and decimals. A few students are not ready and will need to take a step back and be provided with simplified/adapted/modified work with visuals and manipulatives that can further help them understand fractions as parts of wholes.

Supplementary visual aids to have on hand for students that need them:



Free Math Worksheets at <http://www.math-drills.com>