Grade 5 - Week 2

ST Math® Immersion - Virtual

Topic: Comparing and ordering fractions

Week 2 Resources

- Students use benchmark fractions, equivalent fractions and comparing fractions to create a number line to compare and order fractions, place them on a number line, and justify their reasoning for where they placed the numbers. They use this to assess the reasonableness of answers as they add and subtract fractions with unlike denominators.

Week 2 Overview

Day 1

- Class Meeting
  - Opening
  - Goal Setting
- Lessons for the Week
  - Introduction
  - Activate Prior Knowledge
- Independent Assignment
  - Pre-work: Number Line Equivalence
  - My Thinking Path
  - ST Math Puzzles

Day 2

- Problem Solving Discussion
  - Pre-work Review and Discussion
  - My Thinking Path Discussion
- Puzzle Talk: Estimate Fractions on the Number Line
- Independent Assignment
  - Problem of the Day
  - ST Math Puzzles

Day 3:

- Problem Solving Discussion
  - Problem Solving Review and Discussion
  - My Thinking Path Discussion
- Puzzle Talk: Number Line Equivalence
- Independent Assignment
  - Problem of the Day
  - ST Math Puzzles

Day 4:

- Problem Solving Discussions
  - Problem Solving Review and Discussion
  - My Thinking Path Discussion
- Puzzle Talk: Pie Monster
- Independent Assignment
  - Problem of the Day
  - Math Writing Prompt
  - ST Math Puzzles

Day 5:

- Friday Math Clubs
  - Problem Solving Review and Discussion
  - Small Group Math Activity (Choose One)
    - Additional Problem Solving
    - Math Writing Prompt
  - My Thinking Path Discussion
- Independent Assignment
  - ST Math Puzzles

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ST Math
Created by MIND Research Institute

Grade 5 - Week 2 - Day 1

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Class Meeting (20-30 minutes)

Opening

Welcome students to a new week.

- Use the Slide Deck for Class Meeting
  - You may want to use the slide deck to support goal setting, number exploration, which one doesn't belong activities, math data collection stories or you may choose to do the Weekly Warm-Up.

Weekly Warm-Up

- Explain that this week we continue our work with fractions.
  - Let's warm up by playing would you rather:
    - Would you rather have in personal or virtual school?
    - Would you rather have a 4/5 of a pan of brownies or 7/8 of a pan of brownies? Why?
    - Would you rather swim a 3/9 of a mile or ¾ of a mile? Why?
    - Students are welcome to choose either answer if they can justify.

Goal Setting

Discuss last week's goal. Did students achieve their goals? What did they do that helped them? What do they need to improve on?

- Set an ST Math goal for the week.

Lessons for the Week (20-30 minutes)

Introduction

Let students know that this week they will be focused on adding and subtracting fractions with unlike denominators.

- Brainstorm what students know about this topic and what they wonder about this topic.

Activate Prior Knowledge

- Cayden wanted to play the piano for 7 hours this week to prepare for his concert on Saturday. Here is how much he played each day:

Monday	6/5 of an hour
Tuesday	5/2 of an hour
Wednesday	3/4 of an hour
Thursday	?
Friday	?

  - How much did he practice Thursday and Friday if he wanted to reach his goal?
  - If he wanted to take a break Thursday, how could he reach his goal?
- Discuss what they know in the problem and what they need to know to solve the problem.
- Allow students to draw pictures, number lines, or use equations to solve the problem.
- Have students explain and defend their answers.

Independent Assignment (45-60 minutes)

Pre-work

- Complete the Pre-work for Number Line Equivalence.

My Thinking Path

- Have students write in the topic “Comparing and ordering fractions” on their My Thinking Path and complete the first two boxes.

ST Math Puzzles

- Play ST Math for 30 minutes.
- Complete the ST Math Puzzle Reflection.

Grade 5 - Week 2 - Day 2

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Problem Solving Discussion (20-30 minutes)

Pre-work Review & Discussion

- Discuss the first two questions on the pre-work with the students.
- Review the problem. Have students share their strategies and solutions. Discuss.
  - NOTE: You may want to strategically share student work that will promote a rich discussion.

My Thinking Path Discussion

- Ask students to reflect on the discussion yesterday about what they know about comparing and ordering fractions.
- Review the whole group brainstorming and see if there are any additional things students would like to add. Was there anything new that they can add to their understanding after completing the pre-work?
- Discuss any questions the students have. Use this as an opportunity for students to see each other's knowledge as mathematical resources they can build from. The teacher's role here is to facilitate the discussion.
  - NOTE: You may want to put students in breakout groups for the discussion and then return to the whole group to summarize the conversations.

Puzzle Talk: Estimate Fractions on the Number Line (20-30 minutes)

- Focus on student thinking and developing problem solving skills using the Problem Solving Process.
- Have students gather paper/whiteboards to represent problems and show their work.
- Display Grade 5 > Fractions on the Number Line > Estimate Fractions on a Number Line > Level 2

Notice and Wonder

- Show a puzzle from Level 2 that has the fraction in the sky labeled on the number line. Ask students: What do you notice? What do you wonder? Allow students to share.

Predict and Justify

- Have students make a prediction and determine a strategy for solving the puzzle. Have students share their predictions, what they think will happen and why.
- Have students share out. Ask the students to think about if they agree/disagree with the strategy and why. How does it relate to their strategy?

Test and Observe

- Try one of the students' ideas. (As you try students' strategies, be sure to try strategies that work and those that don't.
- Watch the feedback together and discuss what you saw.

Analyze and Learn

- Ask students to think about how what they saw happen compares to their prediction and also have them wonder.

Connect and Extend

- Display a puzzle from Level 1 that does NOT have the fraction in the sky labeled on the number line. Say to students, “In this puzzle, the fraction in the sky is NOT labeled on the number line.”
- Ask students to think about where they should place the fraction in the sky.
- Share students’ strategies for finding the equivalent fraction on the number line. Solve the puzzle and discuss the animation.
- Work through the puzzles in Level 2 and Level 3. As you display each puzzle, have students discuss how they determined the location of the fractions.
- Record the equivalent fractions on a virtual whiteboard or Google Doc. As you add to the list:
- Ask students to look for a pattern as they determine where to place equivalent fractions on a number line.
- Discuss the number and size of the partitions for equivalent fractions.
- Ask questions like, “How many twelfths are in one-third?” or “How many one-fourths make 1 whole? How can you prove ___ fraction and _____ fraction are equivalent? Can you name another equivalent fraction? What happens to the size of the pieces as you make an equivalent fraction?"

How does the student:

- find an equivalent fraction?
- prove two fractions are equivalent?
- locate a fraction on the number line?

Independent Assignment (45-60 minutes)

Problem of the Day

- Create a number line using all of the given fractions (3/6, 7/8, 11/12, 8/6, 1/8, ¾, 25/12, 6/3, 6/12, 6/5, 3/5, 14/8). Be as exact as possible. Select three of the fractions and write an explanation of how you determined their placement.

ST Math Puzzles

- Play ST Math for 30 minutes.
- Complete the ST Math Puzzle Reflection.

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Problem Solving Discussion (20-30 minutes)

Pre-work Review & Discussion:

- Review the problems from yesterday. Have students share their strategies and solutions. Discuss.
  - NOTE: You may want to strategically share student work that will promote a rich discussion.
- Go over the math journal question and discuss.

My Thinking Path Discussion:

- Ask students to reflect on the discussion yesterday and add additional thoughts to their My Thinking Path document. You may want to ask a few students to share how they are thinking about the concept and how their thinking may have been challenged or changed.

Puzzle Talk: Number Line Equivalence (20-30 minutes)

- Focus on student thinking and developing problem solving skills using the Problem Solving Process.
- Have students gather paper/whiteboards to represent problems and show their work.
- Display Grade 5 > Unlike Denominator Concepts and Strategies > Number Line Equivalence > Level 1

Notice and Wonder

- Show a puzzle from Level 1. Ask students: What do you notice? What do you wonder? Allow students to share.

Predict and Justify

- Ask students to think of their strategy for solving the puzzle and predict what will happen when they try it.
- Have students determine a strategy and make a prediction of what will happen when they try it and why.
- Have students type their responses in the chat.
- Have students share out. Ask the students to think about if they agree/disagree with the strategy and why. How does it relate to their strategy?
- Try one of the students' ideas. (As you try students' strategies, be sure to try strategies that work and those that don't. Analyze the feedback in both correct and incorrect solutions.)

Test and Observe

- Watch the feedback together and discuss what you saw.

Analyze and Learn

- Ask students what happened in the puzzle. How does it compare to what they thought would happen?

Connect and Extend

- Display a puzzle from Level 1 that does NOT have the fraction in the sky labeled on the number line. Say to students, "In this puzzle, the fraction in the sky is NOT labeled on the number line."
- Ask students to think about where they should place the fraction in the sky.
- Share students' strategies for finding the equivalent fraction on the number line. Solve the puzzle and discuss the animation.
- Work through the puzzles in Level 2 and Level 3. As you display each puzzle, have students discuss how they determined the location of the fractions.

- Record the equivalent fractions on a virtual whiteboard or Google Doc. As you add to the list:
- Ask students to look for a pattern as they determine where to place equivalent fractions on a number line.
- Discuss the number and size of the partitions for equivalent fractions.
- Ask questions like, “How many twelfths are in one-third?” or “How many one-fourths make 1 whole?”

How does the student:

- find an equivalent fraction?
- prove two fractions are equivalent?
- locate a fraction on the number line?

Independent Assignment (45-60 minutes)

Problem of the Day

- Addie is making two different recipes for the school bake sale. The brownie recipe calls for 2/3 cup of milk and the cut-out cookie recipe calls for 3/4 cup of milk. How much total milk will Addie need to make both of her recipes? Explain.

ST Math Puzzles

- Play ST Math for 30 minutes.
- Complete the ST Math Puzzle Reflection.

Grade 5 - Week 2 - Day 4

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Problem Solving Discussion (20-30 minutes)

Problem Solving Review & Discussion:

- Review the problem. Place students in breakout groups with a partner and have them share their work. Are their number lines the same? Have the students reconcile their differences and determine the best placement for the fractions.
- Allow a couple of groups to share with the whole class.

My Thinking Path Discussion:

- Ask students to reflect on the discussion yesterday and add additional thoughts to their My Thinking Path document. You may want to ask a few students to share how they are thinking about the concept and how their thinking may have been challenged or changed.

Puzzle Talk: Pie Monster (20-30 minutes)

- Focus on student thinking and developing problem solving skills using the Problem Solving Process.
- Have students gather paper/whiteboards to represent problems and show their work.
- Display Grade 5 > Unlike Denominator Concepts and Strategies > Pie Monster > Level 1

Notice and Wonder

- Show a puzzle from Level 1. Ask students: What do you notice? What do you wonder?" Allow students to share.

Predict and Justify

- Ask students to think of their strategy for solving the puzzle and predict what will happen when they try it.
- Have students determine a strategy and make a prediction of what will happen when they try it and why.
- Have students type their responses in the chat.
- Have students share out. Ask the students to think about if they agree/disagree with the strategy and why. How does it relate to their strategy?
- Try one of the students' ideas. (As you try students' strategies, be sure to try strategies that work and those that don't. Analyze the feedback in both correct and incorrect solutions.)

Test and Observe

- Watch the feedback together and discuss what you saw.

Analyze and Learn

- Ask students what happened in the puzzle. How does it compare to what they thought would happen?
- Display another puzzle from Level 1.
- Have students type their predictions and strategies into the chat.
- Try a student's solution and watch the feedback. Pause the puzzle before JiJi crosses the screen. Ask students: How could we represent what is happening in this puzzle with an equation? How did you determine the denominator to represent what the Pie Monster wants to eat as a fraction? How did you determine the denominator for the pies on the table?"
- Have students share their strategies (e.g., Did they use the visual model? Did they find a common denominator? If so, how did they find an equivalent fraction with the same denominator? Did they write a mixed number or fraction?").

Connect and Extend

- Display the first puzzle in Level 2.
- Say to students, “Look at the different visual models of fractions in this puzzle (on Pie Monster and on the table). Which ones have a fraction greater than 1? How could we represent this fraction as both a fraction and a mixed number?” Have students record their answers on their whiteboards. Share the students' fractions and mixed numbers and discuss how they know both represent the same number.
- Have students solve the puzzle and share their strategies for finding a solution.
- Repeat with additional puzzles in Level 2.

How does the student:

- add fractions and mixed numbers with unlike denominators?
- write fractions as mixed numbers?
- write mixed numbers as equivalent fractions?
- write equations to represent the puzzle?
- explain the strategy they used to solve the puzzle?

Independent Assignment (45-60 minutes)

Problem of the Day

- Darla wanted to make 2 gallons of punch to take to the school picnic. She found a recipe that called for ¾ gal of fruit punch, 2 quarts of orange juice, 3/4 gal of 7UP, and ½ gal of water. If Darla makes this recipe, will she have as much punch as she wants? Justify your solution.

Math Writing Prompt

- Halley solved this subtraction problem: 7/8 - ½ = 6/6. Compare the fractions in the equation to help explain why Halley’s solution is not reasonable.

ST Math Puzzles

- Play ST Math for 30 minutes.
- Complete the ST Math Puzzle Reflection

Grade 5 - Week 2 - Day 5

ST Math® Immersion - Virtual

Friday Math Clubs (30 - 45 minutes for each small group)

Problem Solving Review & Discussion:

- Review the problem. Place students in breakout groups with a partner and have them share their work. Are their number lines the same? Have the students reconcile their differences and determine the best placement for the fractions.
- Allow a couple of groups to share with the whole class.

Small Group Math Activity:

Math activities that encourage discussions, sharing ideas, strategies, solutions, and developing student understanding of concepts.

Choose One:

- **Additional Problem Solving:**
  - Continue to deepen students' understanding of the concept by proposing a second problem. Have students work in pairs to discuss how they will approach the problem. They should identify the strategies they will use and why. The purpose of this problem is to promote student thinking through the strategies they use, discussion of effectiveness of strategies, and to provide them the opportunity to evaluate the strategies being used.
    - Kevin filled 4 glasses with different amounts of water so they would make different sounds when he rubbed his finger along the rim.
    - Glass A held 4/8 cup of water, glass B held ¾ cup of water, glass C held 3/6 cup of water, glass D held & 2/6 cup of water.
    - How much water did Kevin use?
    - How much water could he put in a fifth glass if he had 3 cups of water?
- **Math Writing Prompt:**
  - Bart solved this addition problem: ½ + 3/8 = 4/10. Use equivalent fractions to explain to Bart that his solution is not reasonable.
  - Discuss

My Thinking Path Discussion:

- Ask students to reflect on the discussion yesterday and add additional thoughts to their My Thinking Path document. You may want to ask a few students to share how they are thinking about the concept and how their thinking may have been challenged or changed.

Independent Assignment (45-60 minutes)

ST Math Puzzles

- Play ST Math for 30 minutes.
- Complete the ST Math Puzzle Reflection.