



Grade 3 | Module 5

Topic: Write and compare decimal fractions

[Module 5 Resources](#)

Students work with a number line and hundred grid to represent decimal fractions. They compare decimal and fraction forms of numbers. They discuss the relationship of tenths and hundredths.

Module 5 at a Glance

Printed Resources

- **Bookmarks**
 - Problem Solving Process Bookmark
 - Problem Solving Facilitation Bookmark
- **Problem Solving Journal** (pages 26–28)
 - My Thinking Path
 - Problem of the Day
- **Mini-Math Game Design Booklet**
- **ST Math Immersion Debriefing Bookmark**
- **Learning Showcase & Celebration Invitation**

Optional Printed Resources

- Accomplishments Log
- ST Math Activity Pages
- Post-Assessment
- Pre/Post Quizzes

Teacher Resources

- Teacher Planner
- Mini-Math Game Design Guide
- Learning Showcase and Celebration Guide
- Reflection Poster Guide

Immersion Slide Deck (slides 54–72)

- The Immersion Slide Deck is intended to be projected to the class in a whole group setting.

Supplies Needed for Students

- 1 poster board or large sheet of construction paper per student for Reflection Poster
- Various supplies for Mini-Math Game Design

My Thinking Path

- Daily reflection time for students on comparing fractions and equivalent fractions.

ST Math Puzzle Talks

- Fraction Bricks
- Fraction Order Fill

Problem Solving

Day 1:

- **Problem of the Day** - Kiesha, Horatio, and Iris were seeing whose toy car would roll the farthest. They made a long track and marked it every fourth of a foot. Kiesha's car rolled $\frac{13}{4}$ foot. Horatio's car rolled $\frac{10}{4}$ foot. Iris's car rolled $\frac{17}{4}$ foot. Whose car rolled the farthest? What was the order of the cars?

Day 2:

- **Problem of the Day** - Carlos, Lionel, Jamal, and Jane compared the amount of milk they each drank at lunch. Carlos drank $\frac{3}{4}$ of his milk, Lionel drank $\frac{1}{4}$ of his milk, Jamal didn't drink any milk, and Jane drank $\frac{1}{2}$ of her milk. Compare the fraction of milk each person drank, and put them in order from most to the least amount of milk each person drank.

Instructional Stations

Students will only have Instructional Stations on Day 1 & 2 of this module and will only have 2 stations. Use this time to give the Post-Assessment and/or Quizzes. They should rotate through both stations each day.

Station 1: Small Group Instruction

- Administer the Post-Assessment and/or Quizzes.
- Students will review Problem Solving Journal.
- Begin discussion around Mini-Math Game Design.

Station 2: ST Math Puzzles

- Have students sign in and play ST Math puzzles.
 - Remind students to use manipulatives and/or paper and pencil to help them solve problems.
- OR**
- Have students solve the Sudoku puzzles.

Day 3 Thinking and Reflecting Time

PART 1: Reflection Poster

- Students are going to create a [poster](#) that represents the learning they have gained. The poster should reflect how their thinking and understanding has grown. It should be an opportunity for students to show what they know.
- Work with students to review the thinking they have recorded in their Problem Solving Journal (My Thinking Path, Problem of the Day, Exit Tickets, and ST Math Puzzle Reflections) and discuss what they have learned during Immersion.

The Reflection Poster is best done as a small group project because that allows students to engage in higher order thinking skills (e.g., evaluating their learning and the ideas of others, synthesizing their thoughts and the thoughts of others, reaching consensus, and working together). It can however, be done as an individual project.

PART 2: Mini-Math Game Design

- Students will create a game similar to the Table Games they have played throughout the program.
- Use the slide deck to guide students through the process. They will begin with brainstorming games they are familiar with and end by working in small groups to create a game. See Mini-Math Game Design Guide.

Day 4 Learning Showcase and Celebration

The [Learning Showcase and Celebration](#) occurs on the final day of ST Math Immersion. It will serve as a time for students to showcase their learning. It will also serve as a debrief as students share their projects and respond to questions from those attending the event.

- Parents, board members, and community partners can be [invited to attend](#). This is a great opportunity for students to showcase their learning from the Immersion program.
 - Provide students time to make any final adjustments to their game and notes for the presentation of their games.
 - Have groups present their posters and introduce their games to the class.
 - Provide an opportunity for the students to play each other's games.
 - Provide each visitor with an [Immersion Debriefing Bookmark](#) of questions to ask the students.



Grade 3 | Module 5 | Day 1

My Thinking Path (5-10 minutes)

- Have students write in the topic, “Comparing fractions and equivalent fractions.”
- Have students work on the My Thinking Path page in their journals.
- Discuss their ideas, and allow students to add to their paper any additional thoughts they have.
- Have students complete the Pre-Quiz (optional).

Puzzle Talk: Fraction Bricks (20-25 minutes)

- Focus on student thinking and developing problem solving skills using the Problem Solving Process.
- Provide students with paper or whiteboards/dry-erase markers.

Notice and Wonder

- Display the first puzzle in Level 1. Ask “What do you notice about the fraction in the sky? How do we fill in the hole?” Allow a few students to share out.

Predict and Justify

- Have students make a prediction. After they have had some think time, have them think-pair-share about what they would like to try, what will happen when they try it, and why they think it will work.
- Have students share out their predictions and related strategy.
- Select one student’s strategy. Ask the students to think about if they agree/disagree with the strategy and why. How does it relate to their own strategy?

Test and Observe

- Try a student’s solution and watch the feedback. Prompt students to describe what happened, and ask: “What does it mean if two fractions are equivalent?”

Analyze and Learn

- Play the same puzzle again to highlight equivalent fractions, and say to students: “Is there another fraction that is equal to this fraction?” “Can you figure out which fraction will fill this hole, too?”
- Ask students to record the solution on their paper/whiteboards by writing a number sentence using the equal sign (e.g., $2/4 = 1/2 = 3/6$).
- If the puzzle has more equivalent fractions, have students share out the missing fractions. Discuss the name of each fraction as it is added to the hole. Record the comparisons.
- Display the first puzzle in Level 2. Ask students to write down the fraction they think will fill the hole.

Connect and Extend

- Ask students to then write down a fraction that is less than the fraction shown and turn to their partner to share their fraction.
- Share some students’ solutions with the whole group.
- Ask students to then write down a fraction that is greater than the fraction shown and turn to their partner to share their fraction.
- Share some students’ solutions, and prove they are correct.
- Choose one puzzle from Level 2. Have students draw a number line and place the given fraction on the number line. Ask students:
 - How did you know where to place this fraction on the number line?
 - Why are equivalent fractions at the same spot on the number line?

How does the student:

- name each fraction before selecting it to fill the hole?
- determine an equivalent fraction?
- compare two fractions?
- write equations to show equivalence?
- discuss the numerator and denominator of each fraction?
- place equivalent fractions on a number line?

Problem Solving (20-25 minutes)

Engage students in problem solving discussions. Read and discuss the problem, share student work, compare strategies, and make connections.

Problem of the Day

- Kiesha, Horatio, and Iris were seeing whose toy car would roll the farthest. They made a long track and marked it every fourth of a foot. Kiesha's car rolled $1\frac{3}{4}$ foot. Horatio's car rolled $1\frac{0}{4}$ foot. Iris's car rolled $1\frac{7}{4}$ foot. Whose car rolled the farthest? What was the order of the cars?

Instructional Stations (40 minutes)

Students will visit both stations today (20 minutes per station). Instructional Stations will only take place on the first two days of this last module.

Station 1: Small Group Instruction

- Hand out the Post-Assessment and/or Post-Quiz to students.
- Begin a discussion around the Mini-Math Game Design students will be doing on Day 3.
- If students finish early, they can sign in and play ST Math puzzles or any of the Table Games.

Station 2: ST Math Puzzles

- Have students sign in and play ST Math puzzles.
- Remind students to use manipulatives and/or paper and pencil to help them solve problems.

OR

- Have students solve the Sudoku puzzles.



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My Thinking Path (5-10 minutes)

- Have students reflect on what they have learned about comparing fractions and equivalent fractions. Students should complete the My Thinking Path reflection page in their journal.

Puzzle Talk: Fraction Order Fill (20-25 minutes)

- Focus on student thinking and developing problem solving skills using the Problem Solving Process.
- Give students the game mat and centimeter cubes to use to represent their solutions.

Notice and Wonder

- Display the first puzzle in Level 1. Ask “What do you notice? What do you wonder? What do you know about the three fractions in the puzzle?” Allow a few students to share out.

Predict and Justify

- Have students make a prediction. After they have had some think time, have them think-pair-share about what they would like to try, what will happen when they try it, and why they think it will work.
- Have students share out their predictions and related strategy.
- Select one student's strategy. Ask the students to think about if they agree/disagree with the strategy and why. How does it relate to their own strategy?

Test and Observe

- Try a student's solution, and watch the feedback. Ask students to describe what happened using these questions:
 - How can you use the numerator to help compare these fractions?
 - How can you use the denominator to help compare the fractions?

Analyze and Learn

- What did they learn from the feedback? How does this affect their strategy?
- Show the next puzzle. Ask students: “If all of these fractions have the same denominator, how can we use the numerator to compare them?”
- Have students Think, Pair, Share with a partner and record the order of the fractions from least to greatest on their whiteboards. Try a student's solution and watch the feedback.
- Pause the puzzle before JiJi crosses the screen. Ask the students: “How can you use what you know about 1 to order these fractions? How can you compare fractions with different denominators?”

Connect and Extend

- Have students order fractions by writing number sentences. Discuss students' strategies. Did they change the 1 to a fraction? Did they represent the fraction with a denominator of 1? Did they make a model to find a common denominator?).
- Say to students: “How could we represent our solution to this puzzle using a number sentence?” Model how to write a number sentence using $<$, $>$, and/or $=$.
- Repeat the questioning and number sentences for a few puzzles in Levels 1 and 2.
- Choose one puzzle from Level 2, and have students draw a number line and place the three fractions on the number line. Ask students to explain how they compared fractions using a number line.
- Display the first puzzle in Level 4, and ask students: “What is different about this puzzle and the other puzzles we have solved? How can you represent your solution to this puzzle using a number sentence?”
- Students should note that now the puzzles do not all have like numerators or denominators.

- Have students share out their strategies for comparing the fractions. Did they use an equivalent fraction? Did they decide if one of the fractions was closer to 0, $\frac{1}{2}$ or 1, etc.? Did they visualize where each fraction landed by looking at the empty spaces on the grass? Did they draw a number line? Celebrate creative strategies whenever possible.

How does the student:

- discuss the role of the numerator to compare fractions and order them from least to greatest?
- discuss the role of the denominator to compare fractions and order them from least to greatest?
- represent the solution by writing a number sentence?
- determine where to place the three fractions on a number line?

Problem Solving (20-25 minutes)

Engage students in problem solving discussions. Read and discuss the problem, share student work, compare strategies, and make connections.

Problem of the Day

- Carlos, Lionel, Jamal, and Jane compared the amount of milk they each drank at lunch. Carlos drank $\frac{3}{4}$ of his milk, Lionel drank $\frac{1}{4}$ of his milk, Jamal didn't drink any milk, and Jane drank $\frac{1}{2}$ of her milk. Compare the fraction of milk each person drank, and put them in order from most to the least amount of milk each person drank.

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- OR**
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Reflection Poster (30 minutes)

Students are going to create a [Reflection Poster](#) that represents the learning they have gained. The poster should reflect how their thinking and understanding has grown. It should be an opportunity for students to show what they know.

- With the whole class, brainstorm a list of all the things they have learned this summer. Record their ideas on chart paper.
- Discuss major concepts and vocabulary they learned and used during Immersion.
- Work with students to review the thinking they have recorded in their journals (My Thinking Path, Exit Tickets, PODs, Puzzle Reflection) and discuss what they have learned during Immersion.
- Have students add to their journal as you discuss things they have learned but may have not yet included in their journal. This will prepare the students to complete their poster.
- Ask students to work with their group to see what they might want to include on their poster.
- Instruct groups to make their posters colorful, interesting, and informative so students in other classes will see what they have accomplished in the past few modules.
- Give students time to work on their posters.
- The posters will be displayed for the entire school and parents to see on Day 4.

The Reflection Poster is best done as a small group project because that allows students to engage in higher order thinking skills (e.g., evaluating their learning and the ideas of others, synthesizing their thoughts and the thoughts of others, reaching consensus, and working together). It can however, be done as an individual project. Have students think about all of the things that they have learned and make a poster to share what they have learned.

Mini-Math Game Design (Teacher-led, 50 minutes)

Design Process (20 minutes)

See [Mini-Math Game Design Guide](#).

During this time, students will be creating their own game. Display the slide deck and have them complete the [Mini-Math Game Design Booklet](#) to guide them through the process.

- Brainstorm a list of games they have played. Include both the Table Games in Immersion and any other board game they are familiar with. Record the list on a whiteboard or chart paper
- Take the opportunity to discuss the games that students have learned to play. Compare and contrast the games and share opinions, strategies, and experiences. Discuss the impact any of the games have had on the games students are designing.
 - Race to 2
 - Five for Twenty-Five
 - Traffic Lights Tic-Tac-Toe
 - Dara
 - Equivalent Fraction Concentration
 - Multiplication Connect Four
 - Number Line Fraction Bingo
 - Final Countdown
 - Sudoku Puzzles
- When thinking about the game they would like to design, ask students what math concepts they will include.

Mini-Math Game Design (continued)

Making the Game (30 minutes)

During this time, students will be making their game.

- As students are designing their game, they should decide on a game name and directions and rules for their game.
- Students will work in small groups to create a game. Provide them with the supplies needed. The list below are samples of items that could be used.
 - Dice or number cubes
 - Construction paper
 - Scissors
 - Poster board
 - Manila folders
 - Index Cards
 - Egg cartons
 - Water bottles
 - Pizza circles
 - Paper towel rolls
 - Buttons
 - Other creative items
- Once students have a game created, they should test it out with their classmates and make any changes needed. They should complete page 3 in the Mini-Math Game Design booklet.
- The students will be presenting their games at the Learning Showcase and Celebration on Day 4. They will be given the opportunity to play games with the guests.

Prepare for Tomorrow (10 minutes)

- Discuss what students will need to do tomorrow during the Showcase. Include details about:
 - Organizing games and displays
 - Setting up posters
 - Expectations for the day



Grade 3 | Module 5 | Day 4

Learning Showcase and Celebration (Final Day of Program)

Parents, board members and community partners can be [invited](#) to attend. This is a great opportunity for students to showcase their learning from the Immersion program.

- Provide students time to make any final adjustments to their game and notes for the presentation of their games.
- Have groups present their Reflection Posters and introduce their games to the class.
- Provide invited guests a copy of the [Immersion Debriefing Bookmark](#). They should ask students those questions as they visit with each group.
- Provide an opportunity for the students to play each other's games.
- Reflection Poster Gallery Walk (See [Learning Showcase and Celebration Information](#)).

Optional: ST Math Activity Page

ST Math Activity Page

Students will have one final activity page left in their Activity Pages. Encourage students to keep practicing their math skills by continuing to play ST Math Puzzles at home and by completing this final activity page.

Closing

Thinking and Reflecting Time

- Have students complete the Post-Quiz (optional).
- Engage students in discussions about what they have learned this summer, what they have questions about, and what they would like to learn more about.