



Grade 4 | Module 2

Topic: Comparing fractions and understanding equivalence

[Module 2 Resources](#)

Students will compare fractions and understand equivalence. Students create fractions using paper strips. They use the strips and the number line they created to compare fractions and find equivalent fractions. Students solve problems involving comparing and ordering fractions.

Module 2 at a Glance

Printed Resources

- **Bookmarks**
 - Problem Solving Process Bookmark
 - Problem Solving Facilitation Bookmark
- **Grades 3-5 Table Games**
 - Equivalent Fraction Concentration
 - Multiplication Connect Four
 - *Traffic Lights Tic-Tac-Toe (optional)*
 - *Dara (optional)*
 - Number Line Fraction Bingo (Day 4)
 - Final Countdown (Day 4)
- **Game Mats**
 - Estimate Fractions Game Mat
 - 0-5 Number Line Math Mat

- **Problem Solving Journal** (pages 8–13)

- My Thinking Path
- Problem of the Day
- Exit Tickets
- ST Math Reflections

Optional Printed Resources

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

Teacher Resources

- Teacher Planner

Immersion Slide Deck (slides 15–27)

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

Supplies

- Paper fraction strips or other fraction model manipulatives

Supplies for Table Games (per group)

- **Equivalent Fraction Concentration** - 1 deck of Equivalent Fractions cards (2 sheets cut)
- **Multiplication Connect Four** - Two paper clips, 2 sets of 20 colored game pieces or chips (different colors), 1 printed Multiplication Connect Four Game Board.

My Thinking Path

- This module, students will reflect on comparing fractions and understanding equivalence.

ST Math Puzzle Talks

- Common Denominator with Fractions
- Estimate Fractions on a Number Line
- Fraction Order Fill

Problem Solving

Day 1:

- **Problem of the Day** - Jana and Deklan each brought the same size pan of brownies for the class party.
 - Jana cut her brownie into 4 equal size pieces.
 - Deklan cut his brownie into 3 equal size pieces.
 - They needed to give 24 students the same size piece.
 - How could they do this with their two pans of brownies?

Day 2:

- **Problem of the Day** - Howard and Imani were in charge of dividing the clay for their table in art class. Each table had 4 students. Howard divided the clay into 4 equal size pieces. Imani divided the clay into 8 equal size pieces. Both tables fair shared all of their clay. Compare and contrast the clay students at each table received.

Day 3:

- **Problem of the Day** - Draw a number line. Place the following fractions $\frac{3}{6}$, $\frac{7}{8}$, $\frac{11}{12}$, $\frac{8}{6}$, $\frac{1}{8}$, $\frac{3}{4}$, $\frac{25}{12}$, $\frac{6}{3}$, $\frac{6}{12}$, $\frac{6}{5}$, $\frac{3}{5}$, and $\frac{14}{8}$ on the number line. Select three of the fractions you placed on the number line and explain how you determined where to place these fractions. Challenge yourself.

Day 4:

- **Problem of the Day** - Isabella baked a pan of lasagna for her family of 4. She cut the lasagna into 8 equal pieces. Explain how much lasagna each family member might eat. Write equations/inequalities to compare how much each family member ate. Find at least three different ways the family could share the lasagna.

Instructional Stations

On Days 1–3, each student will visit two stations per day following the schedule in the [Instructional Stations Overview](#). On Day 4, students do not participate in Instructional Stations.

Station 1: Small Group Instruction

- Engage students in a math conversation around more problems that involve different fraction models.

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.
- With 5 minutes left, have students stop playing and complete their Puzzle Reflection and [Accomplishments Log](#).

Station 3: Table Games

- Select Equivalent Fraction Concentration or Multiplication Connect Four.
- Have students play that game.
- Ask students to complete an Exit Ticket during the final 5 minutes.



Grade 4 | Module 2 | Day 1

My Thinking Path (5-10 minutes)

- Remind students of the My Thinking Path page in their journal. Have them write in the topic: "Comparing fractions and understanding equivalence."
- 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.
- From today on, begin each of Days 1-4 with time for students to reflect on their learning and prepare for the day.
- Have students complete the Pre-Quiz (optional).

Puzzle Talk: Common Denominator with Fractions (20-25 minutes)

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

Notice and Wonder

- Display the first puzzle in Level 1. Ask: "What do you notice? What do you wonder?" Allow a few students to share out.

Predict and Justify

- Have students think-pair-share their strategies, and then take a few responses, making sure you are encouraging students to agree/disagree with each other.
- Try one of the students' ideas, and perhaps some that don't work.
- Watch the feedback together and discuss the feedback you saw.

Test and Observe

- Ask students to think about the feedback they watched and how it compared to their prediction.

Analyze and Learn

- Replay the puzzle. Make the same selection, and pause the puzzle.
- Have students name the two fractions represented by the two bars. Ask students: "How did you determine which cutter to select? Are the two fractions equivalent? What do they have in common? How do the two fractions compare? Prove that the denominator is the same and one of the bars represents one whole."
- Repeat with several puzzles from Levels 1 and 2.
- Display the first puzzle in Level 3. Ask: "How is this puzzle different from the puzzles we just solved? What can we do to solve this puzzle with the cutters we have?"
- Have students record the names for each fraction before they begin to solve the puzzle.
- Have students use their fraction tools to help them solve the puzzle and share their thinking with a partner. As a whole group, discuss different strategies that students used (e.g., Did they try to match up the two bars visually? Did they know something about the fractions already? Did they find a common denominator?).
- Try a student's solution, and watch the feedback. Pause the puzzle before the pieces fall down to the ground. Ask students to name the new fractions that have been made and record them on their whiteboards.

Connect and Extend

- Work together to write equations and inequalities to compare the two fractions before and after they are cut. Ask students if the total size of the fraction bar changed (e.g., $\frac{1}{2}$ and $\frac{1}{4}$ became $\frac{2}{4}$ and $\frac{1}{4}$) or the names of the fractions changed.
- Repeat with additional puzzles in Level 3.

How does the student:

- write equations and inequalities to compare fractions?
- discuss what happens to the numerator and denominator of the fractions when they are cut?
- compare original unit fractions to the fraction after it is cut?
- write an equation to compare fractions before and after they are cut?

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

- Jana and Deklan each brought the same size pan of brownies for the class party.
 - Jana cut her brownie into 4 equal size pieces.
 - Deklan cut his brownie into 3 equal size pieces.
 - They needed to give 24 students the same size piece.
 - How could they do this with their two pans of brownies?

Instructional Stations (40 minutes)

Students will visit two stations today (20 minutes per station). See [Instructional Stations Overview](#).

Station 1: Small Group Instruction

- Create fractions from paper strips of the same length.
 - Use different colors for different fractions.
 - Use your fraction strips to compare fractions $\frac{1}{2}$, $\frac{3}{4}$, $\frac{6}{8}$, $\frac{2}{8}$, $\frac{3}{2}$, and $\frac{9}{4}$. You may work with a partner to have enough unit fractions to create some of these fractions.
 - Place each of these fractions on the number line you created in the last module.
- Discuss why students may or may not be able to place the strips along the line to plot the fractions.
- Select fractions similar to the fraction cards for students to place on a number line.
- Have students use different strategies from the chart to help them place the fractions and compare them to other fractions. OR
- Show puzzles from Fraction Order Fill. Have students use fraction strips, Cuisenaire rods or connecting cubes to compare fractions. Discuss ways to compare and order fractions. Chart any new strategies.

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.
- With 5 minutes left, have students stop playing and complete their Puzzle Reflection and Accomplishments Log.

Station 3: Table Games

- Select Equivalent Fraction Concentration or Multiplication Connect Four.
- Have students play that game.
- Ask students to complete an Exit Ticket during the final 5 minutes.



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My Thinking Path (5-10 minutes)

- Have students reflect on what they have learned about solving problems comparing fractions and understanding equivalence.

Puzzle Talk: Common Denominator with Fractions (20-25 minutes)

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

Notice and Wonder

- Display the first puzzle in Level 4. Ask: “What do you notice that is similar/different from the puzzles we solved yesterday?” Allow a few students to share out.

Predict and Justify

- Have students share the cutting tool they think they should use and why. Try one of the students’ ideas.
- Ask students if there is more than one answer.

Test and Observe

- Turn on auto pause. As you play the feedback, stop the action as the partitions are being cut, and have students think about and describe what is happening.

Analyze and Learn

- Discuss the number created when the two fractions are added together.
- Have students name the two fractions represented by the two bars. Ask students: “How did you determine which cutter to select? Are the two fractions equivalent? What do they have in common? How do the two fractions compare?”
- Ask students: “What happens to the two fractions when they are cut by the number of partitions in the other fraction?”
- Prove that the denominator is the same and one of the bars represents one whole.
- Repeat with several puzzles from Levels 1 and 2.

Connect and Extend

- Show puzzles from Level 5.
- Discuss how this level compares to Level 4.
- Think about and discuss possible solutions.
- Discuss how to name the fractions after they are cut.
- Write an equation to compare the fractions before and after they are cut.
- Show puzzles from Level 6.
- Continue to discuss the fractions before and after they are cut and naming fractions.
- Discuss why they select the cutters they select each time.
- Write equations to represent the fractions that are being added.

How does the student:

- write equations and inequalities to compare fractions?
- discuss what happens to the numerator and denominator of the fractions when they are cut?
- compare original unit fractions to the fraction after it is cut?
- write an equation to compare fractions before and after they are cut?

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

- Howard and Imani were given the same size tub of clay for their table in Art class. Each table had 4 students. Howard divided his clay into 4 equal size pieces. Imani divided her clay into 8 equal size pieces. Both tables fair shared all of their clay. Compare and contrast the clay students at each table received.

Instructional Stations (40 minutes)

Students will visit two stations today (20 minutes per station). See [Instructional Stations Overview](#).

Station 1: Small Group Instruction

- Create fractions from paper strips of the same length.
 - Use different colors for different fractions.
 - Use your fraction strips to compare the fractions $\frac{1}{2}$, $\frac{3}{4}$, $\frac{6}{8}$, $\frac{2}{8}$, $\frac{3}{2}$, and $\frac{9}{4}$. You may work with a partner to have enough unit fractions to create some of these fractions.
 - Place each of these fractions on the number line you created in the last module.
- Discuss why students may or may not be able to place the strips along the line to plot the fractions.
- Select fractions similar to the fraction cards for students to place on a number line.
- Have students use different strategies from the chart to help them place the fractions and compare them to other fractions. OR
- Show puzzles from Fraction Order Fill. Have students use fraction strips, Cuisenaire rods or connecting cubes to compare fractions. Discuss ways to compare and order fractions. Chart any new strategies.

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.
- With 5 minutes left, have students stop playing and complete their Puzzle Reflection and Accomplishments Log.

Station 3: Table Games

- Select Equivalent Fraction Concentration or Multiplication Connect Four.
- Have students play that game.
- Ask students to complete an Exit Ticket during the final 5 minutes.



Grade 4 | Module 2 | Day 3

My Thinking Path (5-10 minutes)

- Have students reflect on what they have learned about solving problems involving comparing fractions and understanding equivalence.

Puzzle Talk: Estimate Fractions on a Number Line (20-25 minutes)

- Focus on student thinking and developing problem solving skills using the Problem Solving Process.
- Provide students with a copy of [Estimate Fractions Game Mat](#), [0–5 Number Line Math Mat](#), and whiteboards/dry-erase markers.

Notice and Wonder

- Give students the Estimate Fractions Game Mat.
- Display the first puzzle in Level 2. Ask: “What do you notice? What do you wonder?” Allow a few students to share out.

Predict and Justify

- Have students model the puzzle and their solution on their game mat. Ask students to predict and explain where the rocket should go based on the given fraction, first sharing with a partner and then sharing whole group.

Test and Observe

- Select a student to show where the rocket will go. Watch the feedback.
- Ask students to explain what they learned from the feedback. Replay the puzzle, select the same answer, and click the screen once to pause. Ask students what the arrow means (e.g., for $\frac{3}{5}$ the number line is divided into fifths. JiJi makes 3 jumps the size of $\frac{1}{5}$ each on the number line).

Analyze and Learn

- Show the next puzzle. Have students use their game mat to show their prediction of where the rocket should land. Have students share their predictions with a neighbor.
- Discuss as a whole group the strategies students are using for locating a fraction on the number line. Discuss how they partition the number line and then locate the fraction.
- Have students mark the location of the fraction on the 0-5 Number Line Math Mat.
- Select some students to share their strategy. Solve the puzzle. Repeat with more Level 2 puzzles, as needed.

Connect and Extend

- Display the first puzzle in Level 4. Ask students: “How do these puzzles compare to the puzzles in Level 2?” Have students turn and talk to a neighbor about how the puzzles are different, and mark the location of the fraction on the 0-5 number line.
- Discuss strategies for locating the fraction on the number line and how students are identifying which two whole numbers the fraction is located between.
- Ask: “Is there another name for this fraction?” Focus your discussion on equivalent fractions, mixed numbers, and benchmarks on the number line.
- Repeat with the remaining puzzles in Level 4.

How does the student:

- use benchmarks to locate fractions (e.g., I know $\frac{1}{2}$ is here, and this is between $\frac{1}{2}$ and 1)?
- decide which whole numbers to locate a fraction between?
- explain fraction equivalence?
- use the number line to add/subtract and determine the location of fractions?

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

- Draw a number line. Place the following fractions $\frac{3}{6}$, $\frac{7}{8}$, $\frac{11}{12}$, $\frac{8}{6}$, $\frac{1}{8}$, $\frac{3}{4}$, $\frac{25}{12}$, $\frac{6}{3}$, $\frac{6}{12}$, $\frac{6}{5}$, $\frac{3}{5}$, and $\frac{14}{8}$ on the number line. Select three of the fractions you placed on the number line and explain how you determined where to place these fractions. Challenge yourself.

Instructional Stations (40 minutes)

Students will visit two stations today (20 minutes per station). See [Instructional Stations Overview](#).

Station 1: Small Group Instruction

- Create fractions from paper strips of the same length.
 - Use different colors for different fractions.
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 - Place each of these fractions on the number line you created in the last module.
- Discuss why students may or may not be able to place the strips along the line to plot the fractions.
- Select fractions similar to the fraction cards for students to place on a number line.
- Have students use different strategies from the chart to help them place the fractions and compare them to other fractions. OR
- Show puzzles from Fraction Order Fill. Have students use fraction strips, Cuisenaire rods, or connecting cubes to compare fractions. Discuss ways to compare and order fractions. Chart any new strategies.

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.
- With 5 minutes left, have students stop playing and complete their Puzzle Reflection and Accomplishments Log.

Station 3: Table Games

- Select Equivalent Fraction Concentration or Multiplication Connect Four.
- Have students play that game.
- Ask students to complete an Exit Ticket during the final 5 minutes.



Grade 4 | Module 2 | Day 4

My Thinking Path (5-10 minutes)

- Have students reflect on what they have learned about solving problems involving comparing fractions and understanding equivalence. 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.
- Provide students with whiteboards/dry-erase markers.

Notice and Wonder

- Show a puzzle from Level 1. Ask students: “What do you notice about the three fractions shown? How are they the same? How are they different?”

Predict and Justify

- Have students predict how to solve the puzzle and share their prediction with a neighbor. Ask: “Did your predictions match? What strategies did you use?”

Test and Observe

- Have students share out predictions. Try one of the students’ ideas. Ask students to reflect on how the feedback compares to their predictions.

Analyze and Learn

- Discuss the role of the numerator and denominator. Say to students: “If all of these fractions have the same denominator, how can we use the numerator to compare them?”
- Show the next puzzle. 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. 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 $=$ (e.g., $1/2 > 1/7 > 1/8$).
- Repeat with additional puzzles in Level 1.
- Display the first puzzle in Level 2.
- Ask students: “What do you notice about the three fractions shown? How are they the same? How are they different?” Discuss the role of the numerator and denominator. Say to students: “If all of these fractions have the same numerator, how can we use the denominator to compare them?”
- Repeat with additional puzzles in Level 2.
- Display the first puzzle in Level 3. Ask students what they notice about the fractions in the puzzle. Ask students: “How can you compare fractions with different denominators?”
- Have students use what they have learned to order the fractions. Discuss students’ strategies (e.g., Did they change the 1 to a fraction? Represent the fraction with a denominator of 1? Did they make a model to find a common denominator?).
- Repeat with additional puzzles in Level 3.

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?
- compare fractions with unlike denominators?
- explain their strategy for finding a common denominator?
- represent 1 as a fraction?

Problem Solving (20-25 minutes)

Problem of the Day

- Isabella baked a pan of lasagna for her family of 4. She cut the lasagna into 8 equal pieces. Explain how much lasagna each family member might eat. Write equations/inequalities to compare how much each family member ate. Find at least three different ways the family could share the lasagna.

Whole Group Table Games (15-20 minutes)

During this time you will introduce Number Line Fraction Bingo and Final Countdown. Students will play these games in the next module in Station 3.

- Introduce one of the Table Games.
- After explaining the game and playing it with the whole group, give students time to play it on their own.
- After they play the game, have them discuss:
 - What math did they learn or use?
 - What strategies did they try to win the game?
- Repeat with the second game.

Optional: ST Math Activity Page (15 minutes)

ST Math Activity Page

- Project the game, *Estimate Fractions on a Number Line*.
- Play a few puzzles to help students understand the game.
- Have students turn to the ST Math Activity Page: *Estimate Fractions on a Number Line*.
- Ask students what they notice about the content on the page. What do they wonder? Where do they want to start on the page?
- Give them time to complete the page.
- Discuss the page, and have students share their thinking.
- Take the time to compare strategies, and have students share their work.
- Make connections to the game.

Closing (10 minutes)

Thinking and Reflecting Time

- Have students complete the Post-Quiz (optional).
- Have students review their ST Math Puzzle Reflection, Exit Tickets, and Problem Solving work.
- Engage students in discussions about what they have learned in this module, what they have questions about, and what they would like to learn more about.