



Grade 4 - Week 1

ST Math® Immersion - Virtual

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Topic: Acclimate Students to ST Math Virtual Immersion

[Week 1 Resources](#)

- During this week, students will discuss strategies and practice how to overcome hurdles in ST Math. They will have opportunities throughout Immersion to relate overcoming hurdles to the larger world of math and beyond.
- Students will also learn the components of the program (My Thinking Path, Exit Tickets, Puzzle Talks, Pre-work, Problem of the Day, and Math Writing Prompts).
- Most importantly, students will reflect on their thinking and the strategies they use to solve problems and overcome challenges as they get excited about exploring mathematics.

Week 1 Overview

Day 1

- Class Meeting
- Lessons for the Week
 - Introduction to ST Math
 - Goal Setting
- Problem Solving
 - Problem of the Day
 - Math Writing Prompt
- Immersion 4th Grade Pre-Assessment
- Independent Assignment
 - ST Math Puzzles

Day 2

- Class Meeting
 - Review and Discussion
- Puzzle Talk: Big Seed
- Independent Assignment
 - Pre-work: Scale Fractions
 - My Thinking Path
 - ST Math Puzzles

Day 3:

- Problem Solving Discussion
 - Pre-work Review and Discussion
 - Bonus Activity
 - My Thinking Path Discussion
- Puzzle Talk: Scale Fractions
- Independent Assignment
 - Problem of the Day
 - Math Writing Prompt
 - ST Math Puzzles

Day 4:

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

Day 5:

- Friday Math Clubs
 - Problem Solving Review and Discussion
 - Small Group Activity
 - Finding Equivalent Fractions Activity
 - My Thinking Path Discussion
- Independent Assignment
 - ST Math Puzzles



Class Meeting (15-20 minutes)

Opening

Welcome students to the start of Immersion.

- Use the Slide Deck for [Class Meeting](#) to support this opening class meeting.
- The purpose of this class meeting is to
 - build community
 - set norms
 - establish procedures
 - introduce ST Math (if needed)
 - introduce ST Math Immersion and its components (My Thinking Path, ST Math Puzzle Reflections, Puzzle Talks, Pre-work, Problem of the Day, and Writing Prompts).
 - answer any questions the students may have to better prepare them for the ST Math Immersion virtual program.

Lessons for the Week (20-30 minutes)

Reminder About or Introduction to ST Math

If your students have used ST Math, you will not need to do a formal introduction to the program. Instead focus on engaging them in discussions where they can share tips, encouragement, and success stories with ST Math.

- Brainstorm what students like about ST Math. What tips do they have to share? What do they do when they get stuck?
- Have students share their favorite games and why they are their favorites.
- Discuss goal setting with students and set a puzzles and minutes goal for this first week.
- Provide students with a tracker and walk them through how to use it.
- Let the students know if they will be doing the Journey, Assignments or both. Remind them that you are able to see the minutes and puzzles they have completed during the week.

For students who are new to ST Math

- Choose one of the following ways to introduce ST Math to your students.
 - Read students the *JiJi to the Top* [book](#) or show a [video telling the story](#) to introduce ST Math.
 - Play the Slinky [game](#) with your students. During game play explain that ST Math is a program that teaches math in a very different way.
 - Encourage students to look at the visual models on the screen and determine what they think they should do.
 - Point out the things that are clickable and the clues that are given on the screen (click on the sky and the parts of the screen shimmer to show you where to click).
 - For students in grades 2 and up, share that each objective begins and ends with a short quiz.
 - Make sure students understand that they have to complete all the puzzles in a level before moving on to the next.
- Ask students if ST Math reminds them of other math programs. Why or why not?

Goal Setting

- Discuss goal setting with students and set some goals for this first week of their asynchronous ST Math time. Appropriate weekly goals might include (logged in every day, spent 60 min playing, earned 40 puzzles, etc.).

Problem Solving (20-30 minutes)

Problem of the Day

- Create a class “Getting to Know Our Class” Chart. Ask the students questions to gather data about the class and record the information on a virtual white board, google doc, or word document. Record their responses with tally marks. (You will use this information throughout the week so it is important that it is in a form you can refer back to. Determine which questions you want to ask and how many data sets you want to discuss with the students.)
 - Some questions you may ask to gather data might include: How many students are in this class? How many students have brown eyes? Blue eyes? Green eyes? How many students in the class have black hair? Brown hair? Blonde hair? Red hair? How many have pets? Siblings? Favorite subject? Favorite flavor ice cream? Favorite color?
 - Have students make mathematical comparisons with the data. Have students prove their statements. For example: One-fourth of the class likes strawberry ice cream. There are 20 students in the class and 5 of them like strawberry ice cream. So $\frac{5}{20}$ of the class like strawberry ice cream. $\frac{5}{20}$ is equivalent to $\frac{1}{4}$.

Math Writing Prompt

- Have students complete the math writing prompt “What do you hope to learn in this program?”

Immersion Pre-Assessment - Done Independently (20-30 minutes)

Assign your students the Immersion Grade 4 Pre-Assessment. The information in the Pre-Assessment can be used to (1) gain an understanding of student needs (2) identify ST Math objectives that students may need to be assigned for extra practice (3) measure student understanding from the beginning to the end of the ST Math Immersion program.

Independent Assignment (30 minutes)

This is the time students will work on their own independent of the live lessons with the teacher. It is important for students to be accountable for the learning they do during their independent time. ST Math Puzzle Reflections are great tools to provide to students so they can communicate to the teacher what they have learned.

ST Math Puzzles

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



Class Meeting (10-15 minutes)

Review & Discussion:

- Engage students in a discussion about what they learned during their ST Math time yesterday. (See Opening Meeting Slide Deck) What strategies do they use when they are struggling to figure out a puzzle?
- Discuss mistakes and student struggle.
 - Point out to students that the mistakes are learning opportunities. How do students feel when they learn from mistakes? What are some words or phrases they can say to encourage their classmates when they struggle? (It would be good to collect these as quotes and share them with students in your online classroom where they can access them when they need encouragement.)
 - NOTE: One strategy to help students understand that struggle is good is to re-label struggle by saying that students are entering the Zone of Perseverance.

Puzzle Talk: Big Seed (20-30 minutes)

- Focus on student thinking and developing problem solving skills using the Problem Solving Process.
- Provide students with whiteboards and dry erase markers.
- Display Grade 4 >Challenge Objective > Big Seed > Level 1.

Notice and Wonder

- Tell students you are going to teach them questions they can ask themselves to help think through the puzzles.
- Show the first puzzle and encourage students to complete this sentence “I notice _____” (without suggesting a solution). Have several students share what they notice.
- Tell students a tip to help them is to find what is clickable.
- Once students call out all the components they see on the screen, ask students what they wonder. What is the question this puzzle is asking?”

Predict and Justify

- Encourage students to complete this sentence “My prediction is _____ because_____”
 - Have different students share their predictions and why they think those are the best prediction.
 - Ask students to name or describe their strategy they will use to test their prediction (hypothesis).
 - For example, a student may predict that they have to fill the empty blocks. In this case they would name the strategy of flipping. “My strategy is to flip the shape to fill in the blocks.”

Test and Observe

- Try a few student strategies both correct and incorrect. Watch the feedback and discuss what they observed in the animation.

Analyze and Learn

- Facilitate students through the feedback analysis, understanding what worked and didn’t work. By examining their thinking, students either reinforce their strategies or examine their errors, which provides an opportunity for them to learn from their mistakes.
 - How does this compare to what you thought would happen?
 - What did you learn?
 - How will you use what you learned?

- Be sure to use the playback features to pause, rewind and fast forward the animation and discuss what they are learning from the feedback and use the annotation tools to highlight the learning.
- Encourage students to complete this sentence “Something I learned from the feedback is _____.”
- Continue to facilitate student thinking as you work with through additional puzzles.

Connect and Extend

- Share solutions and discuss how puzzles are different as the levels progress. Include and encourage a variety of strategies/solutions and remember to facilitate, not teach how to solve the puzzles.
- Ask the students if what they learned about how the puzzle behaves can be applied here.
- When playing Level 3, ask the students if there is more than one answer to the puzzle. Explore different solutions and discuss what they thought would happen vs. what did happen.
- Before moving on, ask students to describe what is occurring in the puzzles. What are they learning? Do they notice any relationships or patterns? Chart the math concepts/ words/skills that students discuss.
- Depending on how students are doing with the puzzles, you may want to skip to level 5.
- Have students work in breakout groups to complete a puzzle from Level 5. How did what they learned in their earlier puzzles help them solve this puzzle? (If breakout groups are not possible, partner students up and have them send a private chat with their solutions.)

How does the student:

- solve the puzzles? (Are they visualizing the changes that will happen as they flip and change the color? Do they struggle to keep track of the changes?)
- solve the puzzles when all the pieces are not connected together?

Independent Assignment (45-60 minutes)

Pre-work

- Complete the Pre-work for Scale Fractions.

My Thinking Path

- Complete the first two boxes in My Thinking Path.

ST Math Puzzles

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



Problem Solving Discussion (20-30 minutes)

Pre-work Review & Discussion:

- Put students in breakout rooms and have them discuss their pre-work.
- Discuss as a whole group. You may want to make the discussion around the word problem focus on strategy. You can have students revisit that problem and solve it at the end of the week.
- **BONUS ACTIVITY:** Play two truths and a lie with the students. Use the class data generated on Day 1 to create two true statements and one lie. Have the students determine which statement is not true and prove why mathematically. Make several sets to do with the class (e.g., $\frac{1}{2}$ of our class has a pet, $\frac{1}{4}$ of the class has a dog, $\frac{2}{3}$ of the class has a cat).
 - This provides an opportunity to challenge students, discuss strategy, and informally assess them. This activity can be done as part of the opening class meeting for the remaining days this week.

My Thinking Path Discussion:

- Let students know that this week they will be focused on comparing fractions and counting by unit fractions.
- Brainstorm what students know about this topic and what they wonder about this topic.

Puzzle Talk: Scale Fraction (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 4 > Mixed Numbers > Scale Fractions > Level 2

Notice and Wonder

- 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

- Ask students to think of their strategy for solving the puzzle and predict what will happen when they try it. Have students type their ideas into the chat.
- Have some students share their prediction and why they think it is going to work with the whole group.
- Have students share out.

Test and Observe

- Select one of the student's ideas to discuss. How does it relate to what the other students thought would work?
- Solve the puzzle and have students describe what happened.

Analyze and Learn

- Replay the puzzle with the same solution, but this time pause the puzzle before JiJi crosses the screen. Ask students: "How is the visual model we saw on the top of the screen related to the number line? How do we know the denominator for the unit fraction?" What did we learn and how does that help us with the rest of the puzzles?

Connect and Extend

- Pull up the next puzzle. Have students think about what they need to do to solve it. Discuss.
- Ask students: "How could we represent this model as a fraction? A mixed number?" Have students write their answers on their whiteboards or a piece of paper and hold it up to the screen.
- Share students' answers and discuss.
- Try one of the students' strategies. Watch and discuss the feedback. Were they correct? If so, what did they learn? If not, what will they change?
- Repeat with a few more puzzles in Level 2.
- Ask students questions like "What fractions do you see in the visual model? Do you see fourths? Thirds? Halves? How many? How would you represent this model on the number line? What is the relationship between the whole block and the fractional blocks?"
- As you discuss, have the students share their strategies and how they are thinking about the problem.
- Show a puzzle from Level 4.
- Discuss what students notice and how they will solve the puzzle.
- Ask students questions like, "How would you plot ___ on the number line? What might the model for this number look like?"
- Discuss what happens when you move the cursor to create the partitions for the number line.
- Discuss the relationship of the denominator and the partitions.
- Repeat with additional puzzles in Level 4.

How does the student:

- explain the fractions they see in the visual model? (Do they understand the $1 = 3/3$, which is the same as $1/3 + 1/3 + 1/3$?)
- understand how fractions are represented on a number line? (e.g., Fractions between 0 and 1, 1 and 2).
- represent the model on the number line? (Can they convert the whole number to unit fractions?)
- explain the relationship between the visual model representation and the number line representation?

Independent Assignment (45-60 minutes)

Problem of the Day

- Create a fraction model partitioned into fourths. Build a number line using your bar model. Include numbers halves, fourths and eighths up to 3.

ST Math Puzzles

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



Problem Solving Discussion (20-30 minutes)

Problem Solving Review & Math Journal Discussion:

- 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 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: Fricks (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 3 > Equivalence and Ordering > Fricks > Level 1

Notice and Wonder

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

Predict and Justify

- Ask students: "What do you know about the fraction in the sky? How does it help you know what to do?"
- Ask students to determine a strategy for solving the puzzle and predict what will happen when they try it.
- Have students share their strategy and why it can be used to solve this puzzle.
- Have students share out. Select one of the students' ideas. Ask students: "Why do you think the answer is ___?" Discuss strategies as a class.

Test and Observe

- Solve the puzzle using the strategy and have students describe what happened.

Analyze and Learn

- Ask students: "What did we learn from the feedback and how does that help us with the rest of the puzzles?"
- Ask students: "Is there another fraction that is equal to this fraction? Can you figure out which fraction will fill this hole too?"
- Have students determine an equivalent fraction. Try the student's solution.

Connect and Extend

- Ask students: "Why are these fractions equivalent?" Have students record the equivalent fractions on their whiteboards by writing the fractions using the equal sign showing their equivalence (e.g., $\frac{1}{2} = \frac{2}{4} = \frac{3}{6}$).
- If the puzzle has more equivalent fractions, have students determine the missing fractions and record the comparisons as a number sentence.
- Repeat with other puzzles in Level 1.
- Challenge students to find equivalent fractions that are not part of the puzzle. Discuss their strategies for finding the equivalent fractions.

- Display the first puzzle in Level 2. Ask students to type in the chat the fraction they think will fill the hole.
- Have students draw a number line and place the given fraction on the number line. Then ask students to place all of the equivalent fractions on the number line too. Discuss why equivalent fractions are at the same spot on the number line.
- Solve 2-3 more puzzles in Level 2. All of the denominators in Level 2 are eighths, so continue to add equivalent fractions to the number line as students solve puzzles.
- Display the next puzzle in Level 2.
- Ask students to then write down a fraction that is less than the fraction shown. Have students share their fraction with a partner by private chatting and work to prove that each fraction is less than the fraction shown in the puzzle. Share some student's solutions and prove they are correct.
- Ask students to then write down a fraction that is greater than the fraction shown. Have students share their fraction with a partner and work to prove that each fraction is greater than the fraction shown in the puzzle. Share some student's solutions and prove they are correct.
- Solve additional puzzles in Level 2.

How does the student:

- write equations to show equivalence of fractions?
- discuss the size of the fractions (denominator) and the number of unit fractions (numerator) of that size to compare equivalent fractions?
- partition a number line to place fractions?
- add fractions to a number line?

Independent Assignment (45-60 minutes)

Problem of the Day

- Kyle and Juan each had the same size chocolate bar. Kyle cut his into 6 equal size pieces and gave 2 pieces to Carla. Juan cut his bar into 3 equal size pieces and gave 1 piece to Carla. Compare how much chocolate bar each friend has.

Math Writing Prompt

- Explain how to order, from least to greatest, fractions that have the same numerator but different denominators. Give an example to prove your thinking.

ST Math Puzzles

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



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

Problem Solving Review and Discussion

- Review yesterday's Problem of the Day. Strategically share student work that will promote a rich discussion.
- Discuss the math writing prompt.

Small Group Activity

• Finding Equivalent Fractions Activity

- Using the game Fricks, display the first puzzle in Level 3. Ask students to determine all of the equivalent fractions for the puzzle and write them down on a piece of paper or whiteboard.
- Solve the puzzle and move on to the next puzzle.
- Solve 4-5 puzzles and have students keep a list of all of the equivalent fractions they found for each puzzle.
- Have students look at the list and ask, "Are there some fractions that did not have an equivalent in the puzzle? What do you notice about those fractions? Can you find an equivalent fraction for those fractions? Explain."
- Ask students to create a number line and place the list of fractions on their number line. Then, ask students to look at the number line and add additional equivalent fractions to each fraction on their number line.
- Have a few students share their completed number lines and discuss as a class how to prove the fractions are equivalent.

My Thinking Path Discussion:

- Review the learning from this week. Remember to have students go back to the problem solving they have done this week. Have students respond to the following questions:
 - How has your thinking about this problem changed?
 - What is your biggest takeaway?

Independent Assignment (45 minutes)

ST Math Puzzles

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