



# Grade 5 - 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 5th Grade Pre-Assessment
- Independent Assignment
  - ST Math Puzzles

### Day 2

- Class Meeting
- Puzzle Talk: Big Seed
- Independent Assignment
  - Pre-work: Complementary Fractions
  - My Thinking Path
  - ST Math Puzzles

### Day 3:

- Problem Solving Discussion
  - Pre-work Review & Discussion
  - Bonus Activity
  - My Thinking Path Discussion
- Puzzle Talk: Complementary 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: Fraction Decimal Trap
- 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)
    - Complementary Fractions Activity
    - Fraction-Decimal Trap Discussion Problems
    - Math Writing Prompt
  - 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 - 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 5 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. 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 (20-25 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 5 >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 Complementary 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

- 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.
- **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. (e.g. About half of our class has 2 siblings,  $\frac{1}{4}$  of our class likes chocolate ice cream,  $\frac{1}{8}$  of our class likes blue. One of these should not be true.) Have the students determine which statement is not true and prove why mathematically. Make several sets to do with the class.
  - 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 decimals.
- Brainstorm what students know about this topic and what they wonder about this topic.

## Puzzle Talk: Complementary Fractions (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 > Fraction and Decimal Concepts > Complementary Fractions > 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

- 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

- 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.
- Pull up the next puzzle and compare the different forms for writing the numbers.
- Ask students: How could we represent what we see in this puzzle with an equation? Give time for students to write equations.
- Share out students' solutions and discuss whether there are multiple ways to represent the puzzle (e.g.,  $\frac{1}{3} + \frac{1}{3} + \frac{1}{3} = 1$  or  $\frac{3}{3} = 1$ ).

## Connect and Extend

- Show puzzles from Level 2, and discuss similarities/differences from Level 1.
- Have students discuss their solution strategies.
- Show students a hundreds grid. Discuss what the solution would look like on this grid.
- Make sure students notice there are 100 squares. How would they show tenths? Fifths?
- Have students show and discuss the equation for the puzzle. Ask, "What is the multiplication expression equivalent to the addition expression shown?"
- Give students a chance to compare the numbers and the grid. Show puzzles from Level 3 and 4.
- Have students show and discuss the equation for the puzzle. Have students write the decimal equivalence for each fraction and show the equation with decimals. (Show addition and multiplication equations.)
- Point to one of the unit fractions. Ask, "What decimal is equivalent to this unit fraction? What would the sum be if all these unit fractions were shaded? What would the multiplication expression be?"

## How does the student:

- understand the relationship of unit fractions ( $\frac{1}{2}$ ,  $\frac{1}{3}$ ,  $\frac{1}{4}$ ,  $\frac{1}{5}$ ,  $\frac{1}{10}$ ) to decimals?
- determine the number of unit fractions needed to equal the given decimal sum?
- create addition and multiplication equations using both fractions and decimals?
- record the sum on a hundred grid to compare tenths to hundredths?

## Independent Assignment - 45-60 minutes

### Problem of the Day

- Trisha was in charge of making a sign for each  $\frac{1}{4}$  mile distance for a 2-mile race. She marked the distances in decimals. What numbers did Trisha write on her signs?

### Math Writing Prompt

- On a number line, how can you compare fractions and decimals? How do you know if a fraction and a decimal are equivalent on a number line?

### ST Math Puzzles

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



## Problem Solving Discussion (20-30 minutes)

### Problem Solving Review & 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: Fraction Decimal Trap (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 > Fraction and Decimal Concepts > Fraction Decimal Trap > 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

- 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 and analyze the feedback in both correct and incorrect solutions.)
- 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.
- Replay the puzzle selecting the same solution. Pause the puzzle before JiJi crosses the screen. Discuss how the number line is partitioned: "Is there another way to partition the number line? How do you know?"
- Share other puzzles. Compare the puzzles showing a fraction to the puzzles showing decimals. Write an equation to show how the two are equal (e.g.,  $5/10 = 0.5$ ).
- Ask students to use their paper/whiteboard to prove that this equation is true.
- Solve additional puzzles in Level 2, focusing on the relationship between fractions and decimals.



## Connect and Extend

- Show a puzzle from Level 3.
- Ask students: What is different about this puzzle and the puzzles we just solved? Discuss the number of bars between the tick marks for tenths and hundredths and compare. Discuss how students determine where to place the fraction/decimal. *You may want to solve the puzzle to bring up the playback and annotation features so you can pause and rewind the animation.*
- Compare the puzzles showing a fraction to the puzzles showing decimals. Write an equation to show how the two are equal (e.g.,  $5/100 = 0.05$ ). Ask students to use their paper/whiteboard to prove that this equation is true.
- Show puzzles from Level 6.
- Discuss different student's strategies for locating the number on the number line.
- Continue to have students compare the fraction and decimal forms of the numbers.

## How does the student:

- locate fraction form ( $1/10$ ,  $1/100$ ) and decimal form ( $0.1$ ,  $0.01$ ) of numbers on a number line labeled 0 to 1 with tick marks for every tenth.
- compare fraction and decimal forms of numbers.
- recognize that there are 10 hundredths for every tenth ( $0.01 \times 10 = 0.1$ ).

## Independent Assignment (45-60 minutes)

### Problem or the Day

- Trisha's coach gave her this number line to record her distances for the first mile. Mark and label the quarter mile distances shown on her signs. If needed, you can draw the number line larger below.

### Math Writing Prompt

- Explain how you would place  $3/5$  on a number line partitioned into tenths.

### 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 journal.

### Small Group Math Activity:

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

#### Choose One:

##### • Complementary Fractions Activity:

- Using the game Complementary Fractions, display a puzzle from Level 3.
- Read the puzzle together to determine how to solve it. (For example, "How many one-fifths are needed to equal six tenths?")
- Have students use paper/whiteboards to work with a partner to solve and to record their answer as a multiplication sentence. (For example,  $3 \times \frac{1}{5} = \frac{6}{10}$ .) Repeat with the remaining puzzles in Level 3.

##### • Fraction-Decimal Trap Discussion Problems:

- Have students work with a partner in a breakout session to solve the discussion problems.
- Discuss each of the problems as a whole group.

##### • Math Journal:

- Marti put an X on a number on the number line. She added 15 to that number and is now on number 40, Explain how to use the number line to find the number she put an X on. Show it on a number line.

### My Thinking Path Discussion:

- Review student's learning with My Thinking Path. Ask them how their thinking has changed around the topic. How have the puzzles helped them better understand the math topic? What additional questions do they have?

## Independent Assignment (45 minutes)

### ST Math Puzzles

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