ST Math
Summer Immersion

Kindergarten | Module 2

Topic: Adding Numbers up to 10

Module 2 Resources

Students develop their understanding of addition up to 10 to solve problems. Students use strategies involving situations of adding to, taking from, putting together, taking apart, and comparing unknowns in different positions. Students will find missing addends; decompose numbers to make adding easier and practice adding one-digit and two-digit whole numbers. Students will represent situations with equations.

Module 2 at a Glance

Printed Resources

- **Posters**
  - Problem Solving Process Poster
  - Design Process Poster
- **K-2 Games**
  - Addition War
  - Pyramid Make Ten
  - *Number Kicker (optional)*
  - *Make Ten Concentration (optional)*
  - Tic-Tac-Ten (Day 5)
  - Number Path Race (Day 5)
- **Mats**
  - Push Box Game Mat
  - One Empty Ten Frame Math Mat
  - Two Empty Ten Frame Math Mat
  - 0—10 Number Line Math Mat
- **Problem Solving Journal** (pages 8–14)
  - My Thinking Path
  - Problem of the Day
  - Exit Tickets
  - ST Math Puzzle Reflections
- **Design Challenge Booklet** (pages 7–13)

Optional Printed Resources

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

Resources

- Teacher Planner

Immersion Slide Deck (slides 21–35)

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

Literature Connection (optional)

- *What Do You Do with an Idea?* by Kobi Yamada

Supplies for Table Games (per group)

- Addition War -1 deck of cards with face cards removed
- Pyramid Make Ten - 1 deck of cards with face cards removed

My Thinking Path

- This module, students reflect on adding numbers up to 10.

ST Math Puzzle Talks

- Push Box Addition to 5
- Push Box Addition to 10
- Ten Frame

Problem Solving

Day 1:

- **Problem Solving Slide Deck** - JiJi ate some fish for lunch and dinner. JiJi had 2 fish for lunch. At dinner JiJi ate 6 more fish. How many fish did JiJi eat altogether?
- **Problem Solving Journal-** Students solve a similar JiJi fish problem.

Day 2:

- **Problem Solving Slide Deck** - JiJi had some cookies. There were 4 cookies on the plate and 4 cookies left in the bag. How many cookies does JiJi have altogether?
- **Problem Solving Journal-** Students solve a similar cookie problem.

Day 3:

- **Problem Solving Slide Deck** - Part 1: Jose's had a box of 2 different kinds of chocolates. Some were caramel, and some were milk chocolate. How many could be caramel, and how many could be milk chocolate? Draw pictures to show the amount of each kind of candy Jose could have. Show two different ways he could have 10 chocolates.
- **Problem Solving Journal-** Students solve a similar problem, but with cars instead of chocolate.

Day 4:

- **Problem Solving Slide Deck** - Part 2: Jose's box of chocolates from Day 3. Write number sentences or equations to represent your pictures of Jose's chocolates.
- **Problem Solving Journal-** Students write equations using the problem from Day 3.

Instructional Stations

On Days 1–4, each student will visit two stations a day for 20 minutes each. On Day 5, students do not rotate. They can either be assigned to a station or allowed to choose which one to go to. Consider assigning students who need additional support to Station 1 to work with the teacher on concepts they are struggling with.

Station 1: Small Group Instruction

- Days 1 & 2: Give students problems similar to the Problem of the Day and puzzle problems. Have students solve the problems.
- Days 3 & 4: Give students problems with different situations. Discuss the journal questions.

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 Addition War or Pyramid Make Ten.
- Have students play that game.
- Ask students to complete an Exit Ticket during the final 5 minutes.

Station 4: Design Challenge

- Days 1 & 2: Students write or draw their ideas for a math game on page 7 of their Design Challenge Booklet.
- Days 3 & 4: Students start to plan their game. Have students complete page 8 in their Design Challenge Booklet.

Day 5: Design Challenge (whole group)

- Optional Literature Connection: Read the book *What Do You Do with an Idea?* by Kobi Yamada
- Discuss with students the ideas they came up with.
- Discuss information needed to play a game, such as directions, number of people, understanding how to win, etc.
- Talk to students about a game like Tic-Tac-Toe or one of the games they played in the games station. Have the students explain the directions for playing the game.

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Kindergarten | Module 2 | Day 1

My Thinking Path (5-10 minutes)

- Introduce the My Thinking Path document to students. Have them write in the topic, “Adding numbers up to 10.”
- Have students begin working on the first two boxes.
- Discuss their ideas, and allow students to add to their paper any additional thoughts they have.
- From now on, each of Days 1-4 begins with time for students to reflect on their learning and prepare for the day.
- Have students complete the Pre-Quiz (optional).

Puzzle Talk: Push Box Addition to 5 (20-25 minutes)

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

Notice and Wonder

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

Predict and Justify

- Have students think-pair-share their strategy and why they think their strategy can be used to solve this puzzle.
- Ask students to share out and try one of the students’ ideas. Ask the students if they agree or disagree with the strategy and why. Is their strategy similar or different?
- Pay attention to the counting strategies students are using (counting on vs. counting all; recognizing doubles and doubles plus one; known facts).

Test and Observe

- Watch the feedback together and discuss what they saw.
- Ask students: “What did you learn from the feedback? Were we correct? Was this strategy similar to or different from yours?”

Analyze and Learn

- While playing different puzzles, try strategies that work and those that don’t. Analyze the feedback in both correct and incorrect solutions.
- Give students the Push Box Game Mat to represent the puzzles. Discuss how they used the game mat to help them solve this puzzle.
- Show a puzzle from Level 3. Have students discuss what they notice about this level.
  - How is it like/different from the previous levels?
  - Will they change their strategies to solve this puzzle? Why or why not?

Connect and Extend

- Select another puzzle, and ask the students to think about what this puzzle would look like with numbers.
  - Have them write an equation to show the problem and/or have them model the problems on their game mat.

How does the student:

- understand what is happening in the puzzle?
- combine the two stacks of blocks?
- represent the puzzle with an equation?
- understand what each number in the equation represents?
- understand the relationship between addition and subtraction? Do they see them as opposites?

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 Solving Slide Deck (slides 24–25)

- JiJi ate some fish for lunch and dinner. JiJi had 2 fish for lunch. At dinner JiJi ate 6 more fish. How many fish did JiJi eat altogether?

Problem Solving Journal (page 9, top)

- Students will complete the Problem of the Day independently. Provide guidance as needed.
- Students solve a similar JiJi fish problem.

Instructional Stations (40 minutes)

Students will visit two stations today (20 minutes in each station). They will visit the other two tomorrow.

Station 1: Small Group Instruction

- Work with students using a ten frame.
- Use the Problem Solving Process to discuss the use of a ten frame with the group.
- Have students tell stories that can be modeled on the ten frame.

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 Addition War or Pyramid Make Ten.
- Have students play that game.
- Ask students to complete an Exit Ticket during the final 5 minutes.

Station 4: Design Challenge

- Have students complete page 7 in their Design Challenge Booklet.
- Students will think about all that they have learned about games and what they know about math. They will write or draw their ideas for games.
- After writing/drawing their ideas, have students share them with their team.
- The team will discuss the idea they want to use for their game.

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My Thinking Path (5-10 minutes)

- Have students reflect on what they have learned about adding numbers up to 10.

Puzzle Talk: Push Box Addition to 10 (20-25 minutes)

- Focus on student thinking and developing problem solving skills using the Problem Solving Process.
- Provide students with a Push Box Game Mat and 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 strategy and why they think their strategy can be used to solve this puzzle.

Test and Observe

- Have students share out. Try one of the students' ideas. Ask the students if they agree or disagree with the strategy and why. How does it relate to their strategy?
- Watch the feedback together, and discuss what they saw.

Analyze and Learn

- Ask students to think about how what they saw happen compares to what they thought would happen. What did they learn from the feedback?
- Be sure to try strategies that work and those that don't. Analyze the feedback in both correct and incorrect solutions.
- Display Puzzle 2 in Level 1. Have students model the puzzle on their Push Box Game Mat using cubes. Ask students to solve the puzzle. Ask students to share their strategy. Discuss a few answers and strategies as a whole class. You can repeat with a few more puzzles.
- Ask students: "What is JiJi doing with the two stacks of blocks? Does JiJi end up with more or less blocks?" Explain to students that when you combine or put together two groups of objects, you are adding.

Level 2

- Show a puzzle from Level 2. Have students think about what they see in this puzzle and discuss what they notice with a partner. Ask students: "What is different in this puzzle compared to the ones we just did? How will we get JiJi across the screen now?"

Connect and Extend

- Display another puzzle and ask the students: "What would this puzzle look like with numbers and symbols?" Have students represent and solve the puzzle.
- Write the math concepts/words/skills that students discuss.
- Share a few solutions with the whole class, and include an equation that represents how they solved the problem.
- Repeat with the remaining puzzles in Level 2 and 3.

How does the student:

- understand what is happening in the puzzle?
- combine the two stacks of blocks?
- represent the puzzle with an equation?
- understand what each number in the equation represents?
- understand the relationship between addition and subtraction? Do they see them as opposites?

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 Solving Slide Deck (slides 28–29)

- JiJi had some cookies. There were 4 cookies on the plate and 4 cookies left in the bag. How many cookies does JiJi have altogether?

Problem Solving Journal (page 9, bottom)

- Students will complete the Problem of the Day independently. Provide guidance as needed.
- Students solve a similar cookie problem.

Instructional Stations (40 minutes)

Students will visit two stations today (20 minutes in each station). They will visit the other two tomorrow.

Station 1: Small Group Instruction

- Work with students using a ten frame.
- Use the Problem Solving Process to discuss the use of a ten frame with the group.
- Have students tell stories that can be modeled on the ten frame.

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 Addition War or Pyramid Make Ten.
- Have students play that game.
- Ask students to complete an Exit Ticket during the final 5 minutes.

Station 4: Design Challenge

- Have students complete page 7 in their Design Challenge Booklet.
- Students will think about all that they have learned about games and what they know about math. They will write or draw their ideas for games.
- After writing/drawing their ideas, have students share them with their team.
- The team will discuss the idea they want to use for their game.

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Kindergarten | Module 2 | Day 3

My Thinking Path (5-10 minutes)

- Have students reflect on what they have learned about adding numbers up to 10.

Puzzle Talk: Ten Frame (20-25 minutes)

- Focus on student thinking and developing problem solving skills using the Problem Solving Process.
- Provide students with a One Empty Ten Frame Math Mat, Two Empty Ten Frame Math Mat, and 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

- Ask students to think of their strategy for solving the puzzle and predict what will happen when they try it. Have students think-pair-share their strategy and why they think it can be used to solve this puzzle.

Test and Observe

- Have students share out. Try one of the students' ideas. Ask the students if they agree or disagree with the strategy and why. How does it relate to their strategy?
- Watch the feedback together, and discuss what they saw.

Analyze and Learn

- Ask students to think about how what they saw happen compares to what they thought would happen. What did they learn from the feedback?
- Be sure to try strategies that work and those that don't. Analyze the feedback in both correct and incorrect solutions.

Connect and Extend

- Display another puzzle in Level 1.
- Give students a One Empty Ten Frame Game Mat and some two-color counters. Have them model the puzzle on their game mat. Have students write the numeral for the number of counters they are representing on their game mat.
- Have them turn and talk to their partner to explain what they did.
- Talk with students about the ten frame and how it is organized. Ask students, "How many would you have if you added one more (two more) counters? How many would you have if you took one (two) away? How does organizing the counters on the ten frame help you know the number quickly?"
- Have students share their counting strategies. Repeat with the remaining puzzles in Level 1.
- Display the first puzzle in Level 2. Ask: "What do you notice that is different? How might this change the strategy that you were using?"
- Allow a few to share their strategies, and discuss with the class. What do they think will happen? Try the strategies and discuss the feedback.
- Display the next puzzle in Level 2. Give students the Two Empty Ten Frames Game Mat and have them model the puzzle on the Two Empty Ten Frame Game Mat using cubes to show the solution.
- Brainstorm with students the math that they learned in this game. Ask students, "How do you think having the ten frame helped you solve these puzzles?"
- Repeat with the remaining puzzles in Level 2. Continue to have the students work through the problems, modeling the problems on ten frames and creating equations.

How does the student:

- model the problem on their paper?
- write numerals to represent the number of counters and equations to represent the problem and solution?
- use ten frames to help them solve the puzzles?
- discuss the benefits of using ten frames for solving problems?
- discuss what each number in the equation represents in the puzzle?

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 Solving Slide Deck (slide 32)

- Part 1: Jose's had a box of 2 different kinds of chocolates. Some were caramel and some were milk chocolate. How many could be caramel, and how many could be milk chocolate? Draw pictures to show the amount of each kind of candy Jose could have. Show two different ways he could have 10 chocolates.

Problem Solving Journal (page 10, top)

- Students will complete the Problem of the Day independently. Provide guidance as needed.
- Students solve a similar problem but with cars instead of chocolate.

Instructional Stations (40 minutes)

Students will visit two stations today (20 minutes in each station). They will visit the other two tomorrow.

Station 1: Small Group Instruction

- Give the students some problems involving addition within 10. For example :
  - A man had 10 dog treats. He gave his dogs 2 treats on Monday and 4 treats on Tuesday. The man believes that he has 4 treats left. Is he right? Explain your answer in pictures or words.
- Discuss what they know in the problem and what they need to know to solve the problem.
- Bring the discussion about each problem to the equation, and discuss what each of the numbers in the equation represents.
- Ask students to compare their drawings, etc., to the numbers in the equations.

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 Addition War or Pyramid Make Ten.
- Have students play that game.
- Ask students to complete an Exit Ticket during the final 5 minutes.

Station 4: Design Challenge

- Have students complete page 8 in their Design Challenge Booklet.
- They will work with their team to determine what game they are going to make and write about it.
- Prior to this station, you may want to talk to the students about how they can work together to pick one idea.

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Kindergarten | Module 2 | Day 4

My Thinking Path (5-10 minutes)

- Have students reflect on what they have learned about solving problems with addition and subtraction.

Puzzle Talk: Ten Frame (20-25 minutes)

- Focus on student thinking and developing problem solving skills using the Problem Solving Process.
- Provide students with a 0–10 Number Line Math Mat, One Empty Ten Frame Math Mat, Two Empty Ten Frame Math Mat and whiteboards/dry-erase markers.

Notice and Wonder

- Show a puzzle from Level 3 (line in ground to 5). Ask: "What do you notice is the same/different from the puzzles we did yesterday? What do you wonder?" Allow a few students to share out.

Predict and Justify

- Have students think-pair-share their strategy and why they think their strategy can be used to solve this puzzle.
- Have students share out. Try one of the students' ideas. Ask the students to think about if they agree or disagree with the strategy and why. How does it relate to their strategy?

Test and Observe

- Watch the feedback together and discuss what they saw.

Analyze and Learn

- Ask students to think about how what they saw happen compares to what they thought would happen. What did they learn from the feedback? Try a few more puzzles, showing strategies that work and those that don't.
- Ask students: "How is this puzzle different from the puzzles from Levels 1 and 2?"
- Have students represent the puzzle on their ten frame, solve the puzzle, and write an equation to represent the solution.
- Repeat with the remaining puzzles in Level 3.
- Give students the Two Empty Ten Frames Game Mat. Show another puzzle.

Connect and Extend

- Show a puzzle from Level 4 (line in ground to 10).
- Have students represent the puzzle on their game mats, solve the puzzle, and write an equation to represent the solution.
- Give students a number line 0 to 10 and have them represent the puzzle on the number line. Show the numbers adding together by jumps on the number line.

How does the student:

- model the problem on their game mat?
- effectively use the Two Empty Ten Frames Game Mat?
- write numerals to represent the number of counters and equations to represent the problem and solution?
- use ten frames to help them solve the puzzles?
- discuss the benefits of using ten frames for solving problems?
- discuss what each number in the equation represents in the puzzle?

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 Solving Slide Deck (slide 35)

- Part 2: Jose's box of chocolates from Day 3. Write number sentences or equations to represent your pictures of Jose's chocolates.

Problem Solving Journal (page 10, bottom)

- Students will complete the Problem of the Day independently. Provide guidance as needed. Students write equations using the problem from Day 3.

Instructional Stations (40 minutes)

Students will visit two stations today (20 minutes in each station).

Station 1: Small Group Instruction

- Give the students some problems involving addition within 10. For example:
  - A man had 10 dog treats. He gave his dogs 2 treats on Monday and 4 treats on Tuesday. The man believes that he has 4 treats left. Is he right? Explain your answer in pictures or words.
- Discuss what they know in the problem and what they need to know to solve the problem.
- Bring the discussion about each problem to the equation, and discuss what each of the numbers in the equation represents.
- Ask students to compare their drawings, etc., to the numbers in the equations.

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 Addition War or Pyramid Make Ten.
- Have students play that game.
- Ask students to complete an Exit Ticket during the final 5 minutes.

Station 4: Design Challenge

- Have students complete page 8 in their Design Challenge Booklet.
- They will work with their team to determine what game they are going to make and write about it.
- Prior to this station, you may want to talk to the students about how they can work together to pick one idea.

Kindergarten | Module 2 | Day 5

Design Challenge (30-40 minutes)

Design Challenge

- Read the book *What Do You Do with an Idea?* by Kobi Yamada. (optional literature connection)
  - Discuss the story. What was this book about? Why do you think the idea followed the boy around? Why did the boy think about giving up his idea? Why did he decide not to give up on his idea? What are some things that you learned from this book?
- Have students share the ideas they came up with for their game. Ask them to share some things they think are important in creating a math game. How will they make these things part of their games? (Write the big ideas on chart paper.)
- Discuss with students the ideas they came up with in the Design Challenge. Point to the IMAGINE part of the poster. Explain that a big part of the design process is imagining what you could make to complete the task. Now that they have imagined some of the things they want to make, it is important to think about how those ideas might work in a game.
- Ask students to explain what information they need to play a game. Answer should include things such as rules, number of people, and understanding how to win. Inform students that directions and rules are really important. Let them know that the focus for today will be on the rules of the game.
- Discuss the game Tic-Tac-Toe. What are the rules of the game? Have the students write the rules in their booklets. It is important to help students understand how to write rules that are clear and easy for the players to understand.
- Working in teams of two, have the students change one rule for Tic-Tac-Toe, write the new rule, and play the game using that rule.
- Discuss how gameplay was affected by their new rule. Reiterate the importance of having clear rules.
- Inform the students that writing rules is only part of what they need to plan for their game.
- They are going to be working on blueprints. Review pages 10–12 in the Design Challenge Booklet with the students. Explain that blueprints allow them to plan out each part of their game so that it is easier to build. Let students know that they will be working on their blueprints, creating a sketch of their game, and writing their rules.
- Share with students that on page 13 of the Design Challenge Booklet they will begin assigning jobs to team members to build their game. As they make their blueprint they can start to think about who will have the job of making the game board, who will make the game cards or game pieces, who will write out all the rules that the group decides on, etc., It is important that everyone in the group helps build the game. On page 13, students will write down their job and the things they will need.
- After reviewing the booklet with the students, give them time to begin their blueprints.

Whole Group Games (15-20 minutes)

Introduce Tic-Tac-Ten and Number Path Race. Students will play these games in the next module in Station 3.

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

Optional Activity Page (15-20 minutes) - whole group

ST Math Activity Page

- Project the game *Ten Frame*.
- Play a few puzzles to help students understand the game.
- Have students turn to the Activity Page: *Ten Frame.*
- 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.

Focused Instructional Time (20 minutes)

Focused Instructional Time

- During this station time, students do not rotate. They can either be assigned to a station or allowed to choose which one to go to.
- This is an excellent opportunity to pull students who need additional support to Station 1: Small Group Instruction, where they can work with the teacher on concepts they are struggling with. Use the Intervention Planner to help target this time with students.

Station 1: Small Group Instruction

- Identify specific students for intervention or extension.
- Choose the ST Math puzzle or problem solving question that the students struggled with.
- You may choose to use the Intervention Planner to help you plan your instruction.

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. They can ask themselves the questions that are on the Problem Solving Process Poster.
- With 5 minutes left, have students stop playing and complete their Puzzle Reflection and Accomplishments Log.

Station 3: Table Games

- Allow students to choose one of the games they have learned.
- Have students play that game.
- Ask students to complete an Exit Ticket during the final 5 minutes.

Station 4: Design Challenge

- Allow students to continue to work on their blueprints.
- Once students have completed their blueprints, they need to create their rules, directions, and assign the task of building the game to different members of their team.
- Remind students that they can record the jobs that need to be done on page 13 of the Design Challenge Booklet.

Closing (10 minutes)

Thinking and Reflecting Time

- Have students complete the Post-Quiz (optional).
- Have students review their 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.