

SUMMER Scholars

Mathematics

Lessons and Activities

Rising 2nd Grade

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SUMMER Scholars

Mathematics

Management Guide



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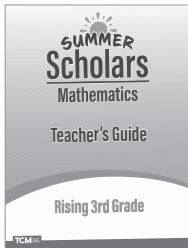
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How to Use This Resource

The *Summer Scholars Mathematics* curriculum has been designed to meet the needs of summer learning programs. Scaffolded lessons, mathematical discourse, and STEAM activities are presented in a flexible format to make learning (and teaching) fun and effective for everyone.

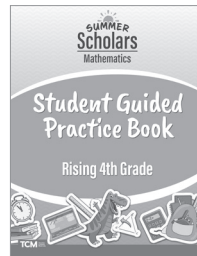
What's Included?

Teacher's Guide



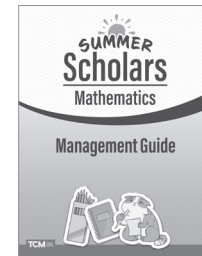
The daily lessons enhance instruction with research-based mathematics instructional practices.

Student Guided Practice Book



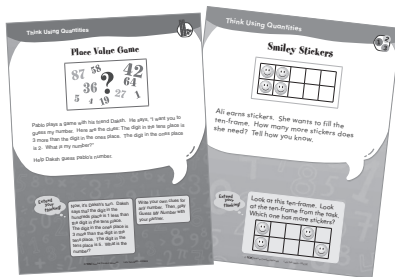
This book encourages students' mathematical fluency with multiple opportunities to apply learning.

Management Guide



This guide helps teachers plan effectively with flexible lesson pacing and a scope and sequence designed specifically for varied summer settings.

12 Mathematical Discourse Task Cards



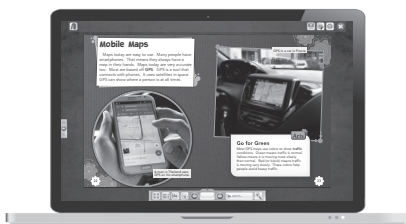
These cards provide rich problem-solving tasks for students to solve and discuss collaboratively. They are provided in both print and digital format.

Smithsonian STEAM Readers



These books and the included STEAM challenges foster content-area literacy and encourage students to collaboratively solve real-world problems.

Digital Resources



These resources increase student engagement and enhance instruction. Family Engagement Letters are provided for a strong school-home connection.

Classroom Library with 10 Books



These mathematics- and science-focused books inspire curiosity and a love of reading.

How to Use This Resource *(cont.)*

Scaffolded Mathematics Instruction

The student-centered Gradual Release of Responsibility model is embedded into each of the mathematics lessons. Within every two-day lesson, the responsibility shifts from the teacher (I Do) to the student (You Do).

Day 1
STEAM Challenge

Making Maps

Define the Problem

1. Display pages 4 and 5 in the Making Maps book. Ask students what they see or what they notice about the images.
2. Create two columns on the board or on chart paper, and label them "Type of Map" and "How It's Used." As a group, brainstorm different types of maps and their many uses in everyday life. Record the ideas in the chart. For example, a road map can be used to help people drive from place to place or to plan a road trip in advance.
3. Reveal the STEAM Challenge by reading aloud pages 26–27 of the book. Have students follow along to the STEAM Challenge on page xx of the Student Guided Practice Book.
4. Display *Make a Map* from page xx of the Student Guided Practice Book. Have students summarize the challenge with partners. Summaries should include constraints and criteria.
 - Support students with the following sentence frame to help them summarize: Create a map that _____.

Vocabulary Activity

1. Write the vocabulary words on the board or on chart paper (accurate, compass, Sahara, satellites, sound waves), and discuss their meanings. Show students images related to the words to build context. (Pictures from the book may be used.)
2. Place students into groups. Assign each group a different vocabulary word. Have groups create small posters for the words, with pictures to help explain their meanings. Then have groups present their work.
3. Explain to students images and text work together to help readers understand information that might otherwise be challenging.

Read Aloud

1. Read aloud the beginning of the *Map* book for about 10 minutes.
2. Have pairs of students discuss information and any questions they have. Ask students to share their thoughts with the whole group.
3. Tell students you will read and act on the next day of instruction.

Icons indicate student groupings: whole group, collaborative, and independent.

Stopwatch icons indicate suggested durations.

Day 2
Place Value

One, Tens, and Hundreds

Progress Monitoring 8

1. Have students complete Quick-Check on page xx of the Student Guided Practice Book to gauge their progress toward mastery of the learning outcomes.
2. Based on the results of the Quick-Check and your observations during the lesson, identify students who may benefit from additional instruction in the learning outcomes. These students should be placed into a small group for reteaching.

Rotations 8

Place students into two groups. Work with one group on the *Refocus* activity while the other group is completing the *Practice* activity. Rotate after 15 minutes. Work with the second group on the *Extend* activity while the first group completes the *Practice* activity.

Refocus 8

1. Provide additional practice building concrete examples of place value with base ten blocks. Have students use base ten blocks to see that when there are 10 ones, this is exactly equal to one ten. As you model, have the ten blocks to prove the equality by one-to-one correspondence. Use 10 tens to build a hundreds square. Again, build directly on equality.
2. After these proofs of equality, present this example:
 - Show eight ones with base ten blocks. Write 8.
 - Add two more ones, counting to 10. Write 10, and point out the 1 in the tens place and the 0 in the ones place.
 - Ask students to find one block that is equal to one ten and zero ones. (*the ten*)
 - Use a ten block and four ones. Ask, "How many ones are there?" (*four*) "How many tens are there?" (*one*) "As an equation, that is 10 + 4. How would we write this number?" (*14*).
3. Support students as they complete Question 1 on *Refocus* from page xx of the Student Guided Practice Book.

Extend 8

1. Have students use patterns to add larger numbers, such as $8 + 4$, $80 + 40$, and $800 + 400$.
2. Support students as they complete the *Extend Learning Task* from page xx of the Student Guided Practice Book.

Practice 8

- **Refocus Group Practice:** Have students solve Question 2 on *Refocus* from page xx of the Student Guided Practice Book to reinforce their learning.
- **Extend Group Practice:** Have students complete *Independent Practice* from page xx of the Student Guided Practice Book to reinforce their learning.

Each lesson page and student page clearly indicates the instructional day.

Assessment opportunities are provided in every lesson.

Independent Practice

Name: _____ Date: _____

Directions: Write the number names and/or standard numerals.

Write the number name in words. Remember: Write it like you say it, and use the vocabulary chart to help you with spelling.

Extend Learning Task

Name: _____ Date: _____

Directions: Using the six digits given, create two three-digit numbers. Subtract them to get as close to zero as possible. For each round, the difference is your score. Remember, zero is the goal, so the lowest score wins!

Round One

Digits: 6 2 2 5 1 3

My numbers: _____

Difference: _____

Round Two

Digits: 4 5 7 8 9 1

My numbers: _____

Difference: _____

Round Three

Digits: 9 5 2 5 4 8

My numbers: _____

Difference: _____

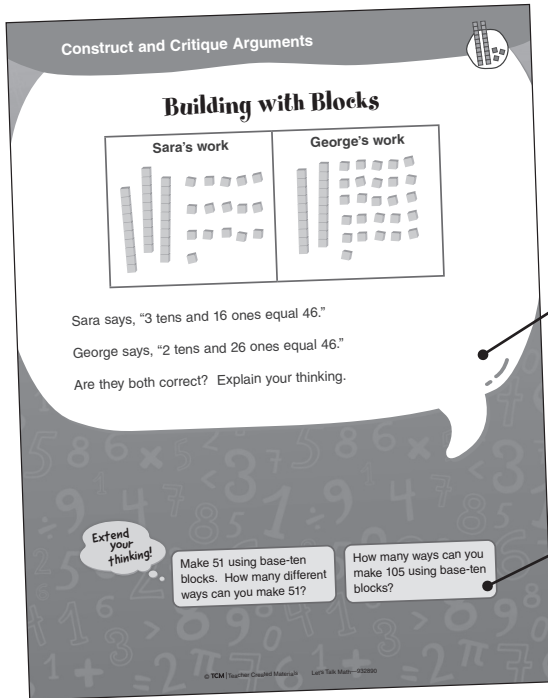
There are many ways for students to access the student activity pages:

- use individual books (purchased separately)
- make copies from provided book
- project pages on an interactive whiteboard
- print pages from digital resources
- share on digital devices (see page 41 for more information)

How to Use This Resource *(cont.)*

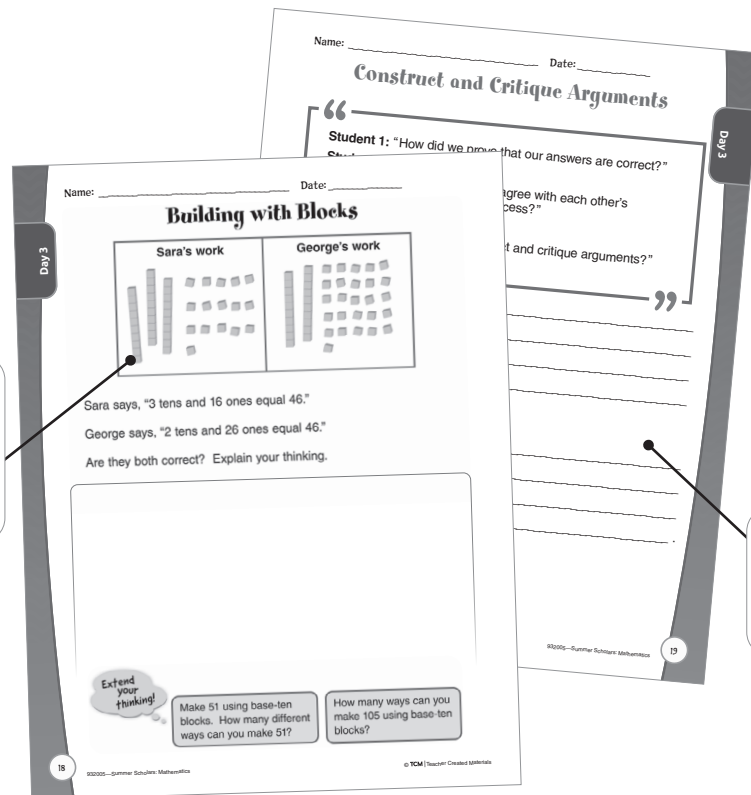
Mathematical Discourse Task Cards

The Mathematical Discourse Task Cards present rich math problems for students to solve and discuss collaboratively. The three mathematical discourse routines walk students through the problem-solving process.



Cards can be displayed for the whole class.

Extension questions challenge students to think more deeply about the mathematical concept.



Cards are reproduced in the *Student Guided Practice Book* for individual use.

Activity sheets help walk students through the routines.

How to Use This Resource *(cont.)*

STEAM Challenges

There are five STEAM Challenges included in each level of *Summer Scholars*. Each challenge is completed over five days to give students ample time to investigate, test, and retest their ideas. In addition to meeting specific criteria, students are also challenged to improve their work over the five days.

STEAM CHALLENGE

Define the Problem
A new student just joined your class. Your teacher has asked you to create a school map for the student.

Constraints: Your map must be drawn from a bird's-eye view. You must include color in your map.

Criteria: Your map must have a map legend, a compass rose, and drawings of important places at your school. It should be clear and easy to use.

Research and Brainstorm
How do maps help people get around? What will different colors mean on your map? What are the important places at your school? Where are they located?

Design and Build
Decide what you will include in your map legend. Then, sketch your school as though you were looking from above. Draw and color your map.

Test and Improve
Share your map with your friends. Ask them to find a place on your map. Did they find it easily? Is your map clear? How can you improve your map? Improve your map, and present it again.

Reflect and Share
Could a new student read and understand your map? How can you make your map easier to follow?

Build background knowledge and spark student interest with engaging readers and short texts.

Students reflect on the process and their final products.

Days 3-4 Overview

Numbers to 1,000
Learning Outcome
Read and write numbers to 1,000 using base ten numerals and number names.

Focus
The following lesson will address these focus questions: What is the difference between a number and a number name? When can both forms be used? How do you use the word 'and' in a number name?

Student Misconception
This particular standard expands on students' previous knowledge. It is common and incorrect for students to add the word 'and' over 100. Watch and listen for this so clarification can be made at that point, which is why the word is not correctly used within why.

Building with Blocks
Learning Outcome
Work collaboratively to solve a problem.

Making Maps
Learning Outcomes
Create and test a map of the school.

Materials

- Student Guided Practice Book (pages xx-xx)
- Number Name Cards (numname.pdf)
- base ten blocks
- chart paper
- construction paper

Rebuild and Refine

Name: _____ Date: _____

Directions: Gather your materials. Plan your steps. Rebuild your structure. Record the changes you make. Tell why you made those changes.

Think About It!
How do you need to change your steps to rebuild your structure?

Steps to Rebuild

Changes Made While Building	Reason for Changes

Materials needed for each challenge are clearly listed. A full list of all STEAM Challenge materials is included in the digital resources.

Activity sheets lead students through the Engineering Design Process.



SUMMER
Scholars

Mathematics

Rising 2nd Grade

Grade Level Details

Rising 2nd Grade Scope and Sequence

		Mathematics Skills and Concepts 60–65 minutes per day		Problem-Solving and Discourse 10–15 minutes per day		STEAM 45 minutes per day	
		Mathematics Focus	Standards	Mathematical Practice and Card Title	Standard	Challenge Title and STEAM Step	Standard
Day 1	Addition Word Problems	Apply properties of addition to add within 20. Explain addition strategies and represent thinking using objects or pictorial models.	Construct and Critique Arguments "Finn's Toy Cars"	Use assumptions, definitions, and previously established results to construct arguments.	Seeing More Stars Define the Problem	Make sense of problems and plan, solve, justify and evaluate solutions.	
Day 2							
Day 3	Addition Equations with an Unknown	Determine the unknown whole number in an addition equation.	Use Tools Strategically "Piggy Bank"	Consider and use available tools when solving problems.	Seeing More Stars Build and Test	Apply mathematics to solve problems arising in everyday life, society, and the workplace.	
Day 4							
Day 5	Subtraction Word Problems	Use subtraction within 20 to solve word problems. Use objects, drawings, or equations to represent the problem.	Think Using Quantities "Bella's Birds"	Make sense of quantities and their relationships in problems.	Seeing More Stars Reflect and Share	Make sense of problems and plan, solve, justify and evaluate solutions.	
Day 6							
Day 7	Subtracting Using a Missing Addend	Determine the unknown whole number in a subtraction equation.	Think Using Quantities "Writing Stories"	Make sense of quantities and their relationships in problems.	Signs and Signals Design and Build	Identify signs and signals animals make to communicate. Develop a bridge that could be used by animals.	
Day 8							

Rising 2nd Grade Scope and Sequence *(cont.)*

Mathematics Skills and Concepts 60–65 minutes per day		Problem-Solving and Discourse 10–15 minutes per day		STEAM 45 minutes per day	
Mathematics Focus	Standards	Mathematical Practice and Card Title	Standard	Challenge Title and STEAM Step	Standard
Day 9 Teen and Decade Numbers	Compose and decompose two-digit numbers using tens and ones. Use concrete and pictorial models to represent numbers up to 120.	Construct and Critique Arguments "Twenty-Six"	Use assumptions, definitions, and previously established results to construct arguments.	Signs and Signals Redesign and Rebuild	Make sense of problems and plan, solve, justify and evaluate solutions.
				Signs and Signals Retest and Share	
Day 10					
Day 11	Order and compare whole numbers up to 100 using greater than, less than, and equal to.	Generalize Your Thinking "Piles of Pennies"	Look for and express regularity in repeated reasoning.	Raising Silkworms Define the Problem	Make sense of problems and plan, solve, justify and evaluate solutions.
Day 12				Raising Silkworms Design	
Day 13	Adding a Two-Digit Number to a One-Digit Number	Construct and Critique Arguments "Cool Counting"	Use assumptions, definitions, and previously established results to construct arguments.	Raising Silkworms Build and Test	Apply mathematics to solve problems arising in everyday life, society, and the workplace.
Day 14				Raising Silkworms Improve	
Day 15	Adding Multiples of Ten to Two-Digit Numbers	Use Tools Strategically "Stacy's Stickers"	Consider and use available tools when solving problems.	Raising Silkworms Reflect and Share	Make sense of problems and plan, solve, justify and evaluate solutions.
Day 16				Conservation Learn Content, Understand the Challenge, and Brainstorm	

Rising 2nd Grade Scope and Sequence *(cont.)*

		Mathematics Skills and Concepts 60–65 minutes per day		Problem-Solving and Discourse 10–15 minutes per day		STEAM 45 minutes per day	
		Mathematics Focus	Standards	Mathematical Practice and Card Title	Standard	Challenge Title and STEAM Step	Standard
Day 17	Subtracting Multiples of Ten	Apply properties of subtraction to subtract multiples of ten within 100.	Use Tools Strategically "Recess"	Consider and use available tools when solving problems.	Conservation Design and Build	Apply mathematics to solve problems arising in everyday life, society, and the workplace.	
Day 18							
Day 19	Nonstandard Measurement: Length	Estimate and express the length of an object. Measure an object using a same-size unit with no gaps or overlaps.	Generalize Your Thinking "Measure It Right"	Look for and express regularity in repeated reasoning.	Conservation Redesign and Rebuild	Make sense of problems and plan, solve, justify and evaluate solutions.	
Day 20							
Day 21	Interpreting Data	Collect and organize data in up to three categories. Use tally marks, pictograph, and bar-type graphs to represent data.	Use Tools Strategically "Color Favorites"	Consider and use available tools when solving problems.	The Art of Shadow Puppets Define the Problem	Make sense of problems and plan, solve, justify and evaluate solutions.	
Day 22							
Day 23	Partitioning into Halves	Partition circles and rectangles into two and four equal shares. Name the parts of the whole using appropriate language.	Analyze the Structure "Pizza Trouble"	Observe closely to discern a pattern or structure in a problem.	The Art of Shadow Puppets Build and Test	Use appropriate tools, including real objects and techniques, to solve problems.	
Day 24							
Day 25	Culminating Activity				The Art of Shadow Puppets Reflect and Share	Apply mathematics to solve problems arising in everyday life, society, and the workplace.	

Rising 2nd Grade STEAM Challenges and Materials

This chart includes descriptions and needed materials for the five STEAM Challenges.


Challenge Name	Description	Materials
<i>Seeing More Stars</i> (reader)	Teams dim light pollution by stopping extra light coming from streetlights.	<ul style="list-style-type: none"> cardboard pieces chalk (optional) construction paper, light and dark options glue light bulb(s) (LED recommended for safety) paper plastic containers staplers table lamp(s) (shades removed) tape
Signs and Signals	Students design and build model bridges that an animal could use to cross a pond safely.	<ul style="list-style-type: none"> cardboard tubes (4–6) cardstock (2–4 pieces) craft sticks (10–20+) limes (2) orange (1) paper plates (2) pipe cleaners (10–15) string (2–4 ft., 1 m)
<i>Raising Silkworms</i> (reader)	Teams create flashlight holders that hang from tent ceilings.	<ul style="list-style-type: none"> cardboard construction paper fabric strips flashlight scissors string twine yarn
Conservation	Students build forts made of newspapers.	<ul style="list-style-type: none"> glue newspapers (3+) stapler tape
<i>The Art of Shadow Puppets</i> (reader)	Teams make shadow puppets to tell the story of “The Three Little Pigs.”	<ul style="list-style-type: none"> cardboard coloring tools such as crayons or colored pencils construction paper dowels, sticks, or craft sticks glue light source(s) such as a lamp, flashlight, or projector paper paper fasteners sheets stapler tape tissue paper

Rising 2nd Grade Classroom Library Information

This chart includes important information about the books included in the classroom library.

Book Title	Lexile® Measure	*Guided Reading Level	Summary
<i>Day at the Parade: Length</i>	490L	M	Lia is excited. She is going to a parade. She likes to see the floats. March along and measure the floats, musical instruments, and bleachers!
<i>Recess: Problem Solving</i>	440L	K	Hooray! Everyone wants to go to recess. Friends can talk and play. Solve problems with addition as you join in the fun!
<i>Light Makes a Rainbow</i>	450L	K	Light is very important. It is a kind of energy. It helps us see. Sometimes, light makes a rainbow of different colors.
<i>Looking Up!</i>	460L	J	There are so many cool things in the sky. At night, you may see the moon and stars. You can use a telescope to see the moon even closer. Next time you are outside, look up.
<i>Counting Coins: Financial Literacy</i>	420L	N	Let's count coins. One, two, three, four pennies... what do you get when you add one more? Counting money can be easy if you take it one coin at a time!
<i>Dog Walkers: Data</i>	440L	L	There are one, two, three, four, five, six leashes! But there is only one dog walker. Collect data on dogs, their leashes, and their tricks!
<i>Raising Babies: What Animal Parents Do</i>	420L	J	Baby animals need their parents. The parents protect, play with, and teach their young. Animals want their babies to grow big and strong.
<i>Robots: 3-D Shapes</i>	470L	O	How do you make a robot? There are many ways. Use 3D shapes and plenty of imagination like the students in Miss Lopez's class.
<i>The Seasons</i>	450L	J	During the summer it is warm outside. During winter it is cold. This is because there are different seasons. They go through a cycle each year.
<i>What Makes a Plant?</i>	400L	J	Plants are living things. They go through a life cycle. Learn more about what plants need to live and grow.

*These titles have been officially leveled using the F&P Text Level Gradient™ Leveling System.



SUMMER
Scholars
Mathematics

Teacher's Guide

Rising 2nd Grade

Days 3–4 Overview

Addition Equations with an Unknown Whole Number

Learning Outcome

- Determine the unknown whole number in an addition equation relating three whole numbers. For example, determine the unknown number that makes the equation true in these equations: $8 + \underline{\quad} = 11$, $6 + 6 = \underline{\quad}$.

Focus

The following lesson will address this focus question: *How can you solve addition equations?* You may wish to write the focus question on the board or on chart paper and read it aloud to students.

Teacher Background

Students will utilize a deeper understanding of addition as they solve addition equations with an unknown whole number in different positions. The use of the *part-part-whole* model in this lesson will provide a helpful visual reference to students. Eventually, students should also begin to recognize fact families as they continue to investigate the relationships among facts.

Mathematical Discourse

Learning Outcome

- Use appropriate tool strategically to solve problems. Understand that tools can be physical like a ruler or mental such as strategic thinking.

Seeing More Stars

Learning Outcome

- Design, build, and test a streetlight hood.

Materials

- *Student Guided Practice Book* (pages 16–27)
- *Piggy Bank* task card
- *Seeing More Stars* book
- Counters (1 counter.pdf)
- chart paper
- markers
- index cards
- tape
- sentence strips

Materials per STEAM Group

- cardboard pieces
- chalk (optional)
- construction paper, light and dark options
- glue
- light bulb(s) (LED recommended for safety)
- paper
- plastic containers
- staplers
- table lamp(s) (shades removed)
- tape

Addition Equations with an Unknown Whole Number

Warm-Up

- Write the following in large print at the top of a sheet of chart paper: *We can make 10!*
- Say, "Ten is an important number. Today we are going to make 10 in different ways."
- Provide each student with two to three index cards, depending on class size. (Smaller groups may have time for three index cards; for larger groups, two may be preferred.) Say, "I want you to think of two numbers you can combine, or add, to make 10. Then, you will show those numbers on a card. You can use numbers, words, or a drawing." Model this for students using the numbers *three* and *seven*. Show them examples:

$3 + 7 = 10$		
three and seven equal ten		
● ● ●	+	● ● ● ● ● ● ● ● = ● ● ● ● ● ● ● ●

- Remind students that they can use any representation they would like, and they should choose different numbers for each index card. If students struggle to come up with numbers, you can assist them by supplying one number and having them generate the other. (For example, tell the student 4, so they generate 6.)
- Provide time for students to create representations. Then, assist them in taping the index cards on chart paper. Conclude by reviewing a variety of student responses.

Language and Vocabulary

- Prior to the lesson, write the following words on the board or on chart paper:

add	equation
difference	subtract
equal	sum

Then, write the following sentences on sentence strips or on chart paper.

- In the problem $5 - 2$, the *sum* is 3.
 - When you *add*, you join two amounts together.
 - In the problem $6 + 2 = 8$, the number 8 is an *addend*.
- First, define each word to the class. Then, hold up a sentence strip. Say, "I am going to read a sentence. I want you to think about how the word is used in the sentence. If it is used correctly, I want you to give me a thumbs-up signal. If it is used incorrectly, I want you to give me a thumbs-down signal!"
 - Read each sentence to the class. Observe students' understanding of the meaning and use of each word. If the word is used incorrectly, ask what word should replace the underlined word.

Addition Equations with an Unknown Whole Number



I Do

- Write the following equation: $5 + 3 = \square$. Explain to students that the box is empty because this is the number they are solving for.
- Say, "To help us solve this problem, we can use a model." Draw a *part-part-whole* model on the board or on chart paper:

Whole	
Part	Part

Say, "This is called a *part-part-whole* model. We can use this model to help us solve problems with addition. What number do we start with? How many are we adding to it?" Once students identify that they start with five and add, ask, "Where do you think these numbers belong in the model?" Lead students to understand that each *addend* is one *part*. When the parts are combined, that is the *whole*. Record each addend in one of the *Part* sections and represent it with dots.

- Ask, "How could we find the whole to complete the model?" Students should identify that they can combine the two numbers by counting on (e.g., counting on from five or counting on from three). Write *Count On* on the board.

Whole	
Part	Part
5 	3 

Support for Language Learners: New language learners may have difficulty remembering all the number names as they count on. Provide students with a number line while counting.

- Work with students to solve for the missing whole by counting on. Practice counting on from five (*five, six, seven, eight*) and also counting on from three (*three, four, five, six, seven, eight*). Show students how to use the dots to help you keep track of the numbers.
- Ask, "What is the whole, or the sum?" When students identify that the sum is 8, record it on the *part-part-whole* model and complete the equation. ($5 + 3 = 8$)
- Say, "Let's try another equation together." Write the equation $2 + \square = 9$ on the board or on chart paper. Ask, "How is this equation the same as the first? How is it different?" Students should recognize that this equation also has a box to show the missing number, but in this equation, they need to solve for an addend, not the sum.
- Draw a new *part-part-whole* model. Ask students if they can identify how to fill in the *part-part-whole* model using the given equation. If needed, help students recognize that the sum, nine, is the whole, and the addend, two, is one part. Leave the left *part* portion blank.
- Remind students of the *count on* strategy. Say, "This time, we will count on a little differently. We will start at 2. For every number we count, we will draw a dot in the missing *part*. We will stop counting when we reach 9 (the whole). Then, we will count the dots to figure out the missing *part*." Use this strategy to determine the missing part (7) and to complete the *part-part-whole* model and the equation.
- Repeat Steps 7–9 with another missing addend equation: $\square + 3 = 10$.

Addition Equations with an Unknown Whole Number

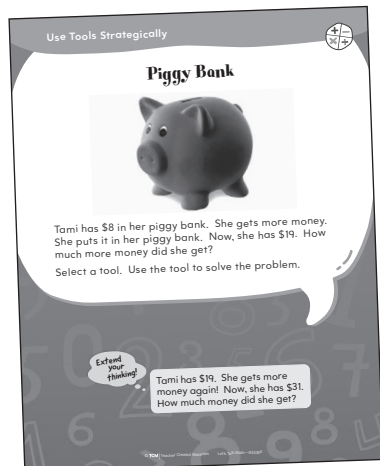
We Do

1. Refer students to *Find the Missing Numbers* from page 16 of the *Student Guided Practice Book*.
2. Use the *part-part-whole* model and the *count on* strategy to solve Questions 1–4 with students. Provide some support by using guiding questions, such as: “How can you show this equation on the *part-part-whole* model?” and “What is a strategy you can use to find the missing part/whole?”
3. As students use the *count on* strategy to complete addition equations up to 20, model for them how to use 10 as a benchmark number to count with. For example, look at Question 1 together. ($7 + 4 = \square$) Ask students to identify how to fill in the *part-part-whole* model. (*Part: 7; Part: 4*) Say, “Let’s use the *count on* strategy. What number should we count on from?” Allow students to share their ideas. If students suggest counting on from 7, say, “Rather than starting at 7 and counting on 4 by ones, I will think of my benchmark number, 10. Counting on from 7, I know that three more gets me to 10. I need to count on a total of 4. So, I will count one more, which gets me to 11.” You can also model the strategy of counting on from 4. For example, “Counting on from 4, I know that six more gets me to 10. I need to count on a total of 7. So, I will count one more, which makes 11.” Be sure students recognize that this procedure can only be followed when the addend they are counting on from is less than 10.
4. Repeat for Question 2 ($10 + \square = 17; 7$), Question 3 ($\square + 6 = 12; 6$), and Question 4 ($11 + \square = 18; 7$).
5. Finally, have students answer Question 5. They will choose one question on the activity sheet and explain how they used the *count on* strategy to solve. Provide them with the following sentence frames to help them explain their thinking.
 - I counted on from the number _____.
 - I counted on _____ more.

You Do

1. Refer students to *Missing Numbers: Add* from page 17 of the *Student Guided Practice Book*. Students will continue to solve addition equations with unknowns in various positions using *part-part-whole*.
2. Have students share their addition equations and reasoning. If students have difficulty explaining their reasoning, remind them to use the sentence frames and vocabulary terms. For example, students should describe how they counted on or counted back to find the missing *part* or *whole* in the model.

Use Tools Strategically



Understand the Strategy

The Use Tools Strategically practice/process stems from *use appropriate tools strategically*. As this practice/process is introduced, it is important that students understand that tools are not always physical. Tools can be as simple as mental math or using one's brain. The word *strategically* is emphasized because mathematicians sometimes do not have access to the most appropriate tools and must rely on their strategic thinking to identify replacement tools. For example, if a ruler or tape measure is not available to measure the length of something, sticky notes or blank paper could be used to get approximate measurements. Those might not be the most appropriate tools, but with strategic thinking, the item can be measured. In these tasks, suggested tools are offered for students to consider using. Sometimes, the tasks don't allow students to use traditional tools. This forces them to think strategically.

Procedure

1. Display the *Piggy Bank* task card, and read aloud the text. Remind students to use the Understand and Plan, Share and Discuss, and Reflect and Write routines as they complete the task. Review these routines if needed. (See pages 21–26 in the *Management Guide*.)
2. Allow time for students to collaborate with partners as they follow the routines and work through the task from pages 18–19 of the *Student Guided Practice Book*. (Students will complete the extension on the next day.)

Answer: Tami got \$11 more. Tool selection will vary.

Possible Misconception: Students may not pay attention to the question and add \$8 and \$19 to get \$27.

Language Support

- **Tier 2:** tool
- **Tier 1:** piggy bank, money

Scaffolding

Provide students with counters or number lines. Replace the numbers in the problem with smaller values, and ask students to use either tool to help them solve the problem.

Seeing More Stars

Materials and Preparation

- Prepare all materials for the STEAM Challenge (cardboard pieces, construction paper, glue, light bulbs, paper, plastic containers, staplers, table lamps, tape).
- Review all designs prior to building.

Read Aloud

1. Review the information from the previous day's read aloud.
2. Play the *Seeing More Stars* audiobook from the digital resources library. Pause periodically to discuss any questions students may have.

Build

1. Have groups review their *Team Designs* activity sheet from the previous day. Explain to students that when they build their models, they must follow their design plans. Reassure that students will have an opportunity to change and improve their design plans after they present them. Review classroom expectations for working with materials. Then, give teams time to gather materials and build their light hoods.
2. Have students complete Question 1 from *Think about It* from page 20 of the *Student Guided Practice Book*. Explain that reflection is an important part of the engineering design process. Read aloud Question 1 on the activity sheet, and have students write their responses. Ask volunteers to share.

Test

1. Gather teams for testing. Explain that teams will offer feedback after the test. Use *Friendly Feedback* from page 21 of the *Student Guided Practice Book* to review best practices for giving feedback.
2. Have students use *Streetlight Hood Test Results* from page 22 in the *Student Guided Practice Book* to record their results in their teams.
3. Have one team at a time place their hood on a table lamp. (**Safety note:** Ensure the materials students used and their designs will not cause a fire hazard when placed on the lamp.) Turn on the lamp and have students observe it. Ask for volunteers to give friendly feedback.
 - You may choose to turn off or dim other lights during testing to see more drastic results.

Addition Equations with an Unknown Whole Number

Progress Monitoring

1. Have students complete *Quick Check* from page 23 of the *Student Guided Practice Book* to gauge student progress toward mastery of the Learning Outcomes.
2. Based on the results of *Quick Check* and your observations during the lesson, identify students who may benefit from additional instruction. These students will be placed in a small group for reteaching.

Rotations

Place students in two groups. Work with one group on the Refocus activity while the other group is completing the Practice activity. Rotate after 15 minutes. Work with the second group on the Extend while the first group completes the Practice activity.

Refocus

1. Revisit the focus question for the lesson: *How can you solve addition equations?* Provide students with unlined paper. This will become a large *part-part-whole* model. Help students fold the paper in half horizontally, unfold it, and trace the fold. Then, have students lay the paper lengthwise, and draw a vertical line to divide the bottom section into two parts. Finally, label the top section *Whole* and each bottom section *Part*. Provide students with counters. Write: $\square + 2 = 7$. Record the equation on the *part-part-whole* model. (*7 is the whole; 2 is one part*) Then, have them model the part by making a group of two counters.
2. Say, "To find the missing part, we need to add counters until we get to seven." Count on from two until they have seven total counters. Students should make the other group of counters in the empty *Part* section. Ask how many counters were added (5), and complete the equation. Repeat to solve $\square + 3 = 11$. ($8 + 3 = 11$)
3. Finally, support students as they solve Question 1 on *Refocus* from page 24 of the *Student Guided Practice Book* independently or with partners.

Extend

1. Solve problems with two missing addends. For example: *Martha has some nickels and some pennies. She has 6 coins altogether. How many nickels and how many pennies could she have?* Say, "We know Martha has six coins. We need to think of different combinations of numbers that equal 6 coins." Guide students in identifying pairs of numbers. (*1 nickel/5 pennies; 2 nickels/4 pennies; 3 nickels/3 pennies; 4 nickels/2 pennies; 5 nickels/1 penny*)
2. Support students as they complete the *Extend Learning Task* from page 25 of the *Student Guided Practice Book*.

Practice

- **Refocus Group Practice:** Have them solve the remaining questions of *Refocus* from page 24 of the *Student Guided Practice Book* to reinforce their learning.
- **Extension Group Practice:** Have students complete *Independent Practice* from page 26 of the *Student Guided Practice Book*.

Addition Equations with an Unknown Whole Number

Math in the Real World

1. Display *Math in the Real World: Swimming Laps* from page 27 of the *Student Guided Practice Book*. Have a student read the task aloud. Tell students to explain or summarize the task to their partners. Have a few students share their summaries.
2. Ask students to think about what information they will need to solve the task and what the task is asking them to do. Then, have them share with partners. Ask a few students to share. Students should identify that we know Josh swam five laps, and Jo also swam laps. We need to find out how many laps Jo swam. Have students work in groups of two or three to complete the task.
3. As students are working, circulate and ask focusing, assessing, and advancing questions:
 - How can you use a *part-part-whole* model to solve?
 - How can you write an equation to match the problem?
4. Observe how students solve the task, and choose a few groups who solved the task in different ways to share their solutions and reasoning. Try to have solutions move from concrete representations to abstract representations. For example, have students share solutions using the *part-part-whole* model. Then, have students share the equation that can be used to solve the problem ($5 + \square = 16$). Make sure students explain their reasoning as they share solutions.
5. As groups share their solution paths, reasoning, and strategies, ask questions:
 - How is this strategy similar to one we have seen in a previous task?
 - Who can restate _____'s strategy/ solution/reasoning?

Support for Language Learners: Use these sentence frames to support students:

- *The whole is _____. The part is _____. To find the missing part, I can _____.*
- *I can use the equation _____ to solve the problem.*
- *Jo swam _____ laps.*

Use Tools Strategically

Mathematical Discourse Card Extension

1. Allow time for students to complete the routines from the *Piggy Bank* task from the previous day.
2. Have students work in pairs to complete the extension:
 - Tami has \$19. She gets more money again! Now, she has \$31. How much money did she get? (\$12)

Seeing More Stars

STEAM Challenge

Materials and Preparation

- Prepare supplies for rebuilding (cardboard pieces, construction paper, glue, light bulbs, paper, plastic containers, staplers, table lamps, tape).
- Review all designs prior to building.

Read Aloud

1. Review the information from the previous day's read aloud. As a group, discuss the following questions to connect the reading to the STEAM Challenge:
 - *How do the lights in the photo on page 14 reduce light pollution?* Guide students to understand that the lights shine only where needed, which is on the stairs, and they are not overly bright.
 - *What color light would be best for a streetlight?* Have students reread the callout box on page 16. Guide students to understand that cooler LED lights shine yellow and are good for nighttime.

Improve

1. Have groups review the feedback they received on the previous day of instruction.
2. Provide time for teams to brainstorm ways to improve their designs based on test results and feedback. Refer students back to their *Team Designs* activity sheets. Ask them to sketch their improved designs and explain any changes.
 - Review improved designs and offer guidance as needed.
 - Challenge successful teams with additional goals for the second design (e.g., place chalk or tape lines on the table to show a specific area that students should try to light up).
3. Have teams gather materials to improve their designs. Then, have them make their improvements and retest their light hoods.
4. Have students complete Questions 2 and 3 on *Think about It* from page 20 of the *Student Guided Practice Book*.

SUMMER
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Mathematics

Student Guided Practice Book

Rising 2nd Grade

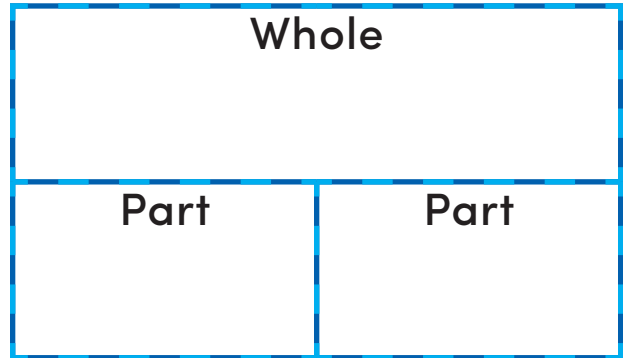
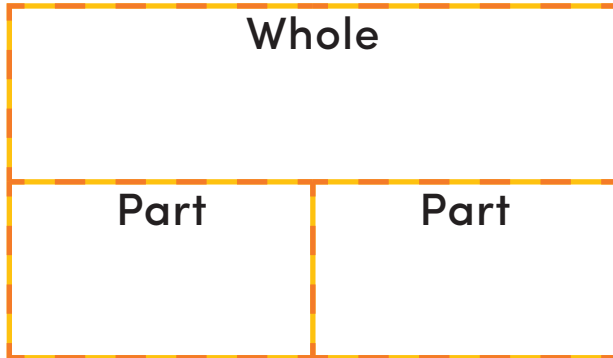


Find the Missing Numbers

Directions: Find the numbers that are missing.

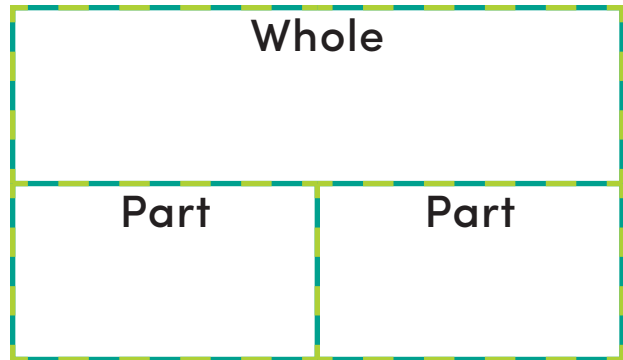
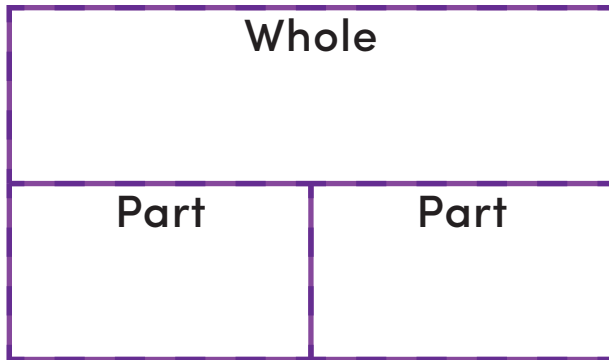
1 $7 + 4 = \square$

2 $10 + \square = 17$



3 $\square + 6 = 12$

4 $11 + \square = 18$



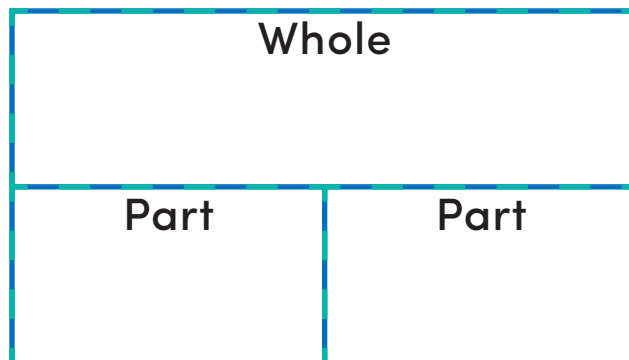
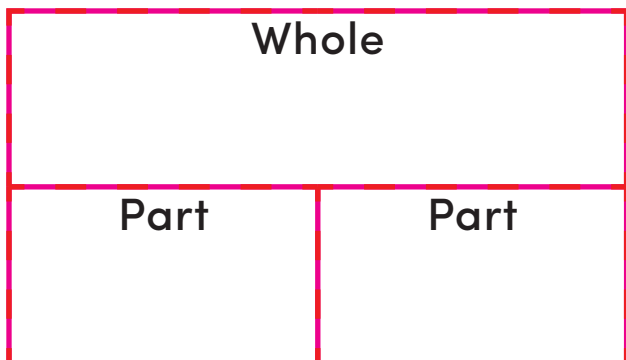
Pick a question. Tell how you solved.

Missing Numbers: Add

Directions: Find the numbers that are missing.

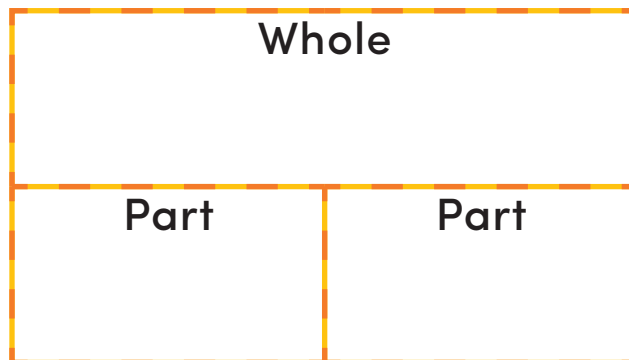
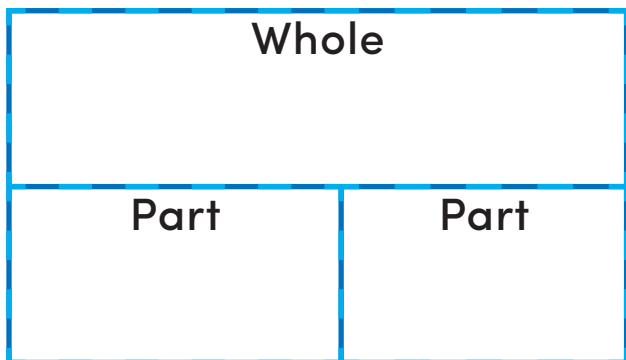
1 + 6 = 11

2 7 + 5 =



3 + 5 = 14

4 8 + = 16



Name: _____ Date: _____



Piggy Bank

Day 3



Tami has \$8 in her piggy bank. She gets more money. She puts it in her piggy bank. Now, she has \$19. How much more money did she get?

Select a tool. Use the tool to solve the problem.

Use Tools Strategically

Reflect and Write

Write or Draw: We used tools strategically by

Extend
your
thinking!

Tami has \$19. She gets more money again! Now, she has \$31. How much money did she get?

Name: _____ Date: _____

Think about It

Day 3

1. I helped my team when _____

2. Our plan (worked/did not work) because _____

3. Our second plan was (better/worse) because _____

4. My favorite part was _____

Name: _____ Date: _____

Friendly Feedback

Directions: Feedback from others can help you. Use these sentence stems. Give feedback to your peers.

Day 3

Clarify

Why did you _____ ?

How did you _____ ?

Warm Feedback

I like _____ because _____ .

_____ is a good idea because _____ .

Cool Feedback

Have you thought about _____ ?

You might want to try _____ .

Name: _____ Date: _____

Streetlight Hood Test Results

Day 3

Directions: Record the results of each team's test. Write or draw what each lamp looks like. Circle the one you like best.

Team	Does the hood focus the light down?	What does it look like?
	<input type="checkbox"/> yes <input type="checkbox"/> no	
	<input type="checkbox"/> yes <input type="checkbox"/> no	
	<input type="checkbox"/> yes <input type="checkbox"/> no	
	<input type="checkbox"/> yes <input type="checkbox"/> no	

Quick Check

Directions: Solve for the missing number. Choose the solution.

1 $10 + \square = 14$

(A) 24

(C) 14

(B) 5

(D) 4

2 $\square + 11 = 16$

(A) 5

(C) 7

(B) 16

(D) 27

Directions: Fill in the missing number. Then, tell how you solved.

3 $\square + 8 = 15$

Whole

Part

Part

Name: _____ Date: _____

Refocus

Day 4

Directions: Find the numbers that are missing.

1 + 5 = 10

2 8 + = 12

3 9 + 7 =

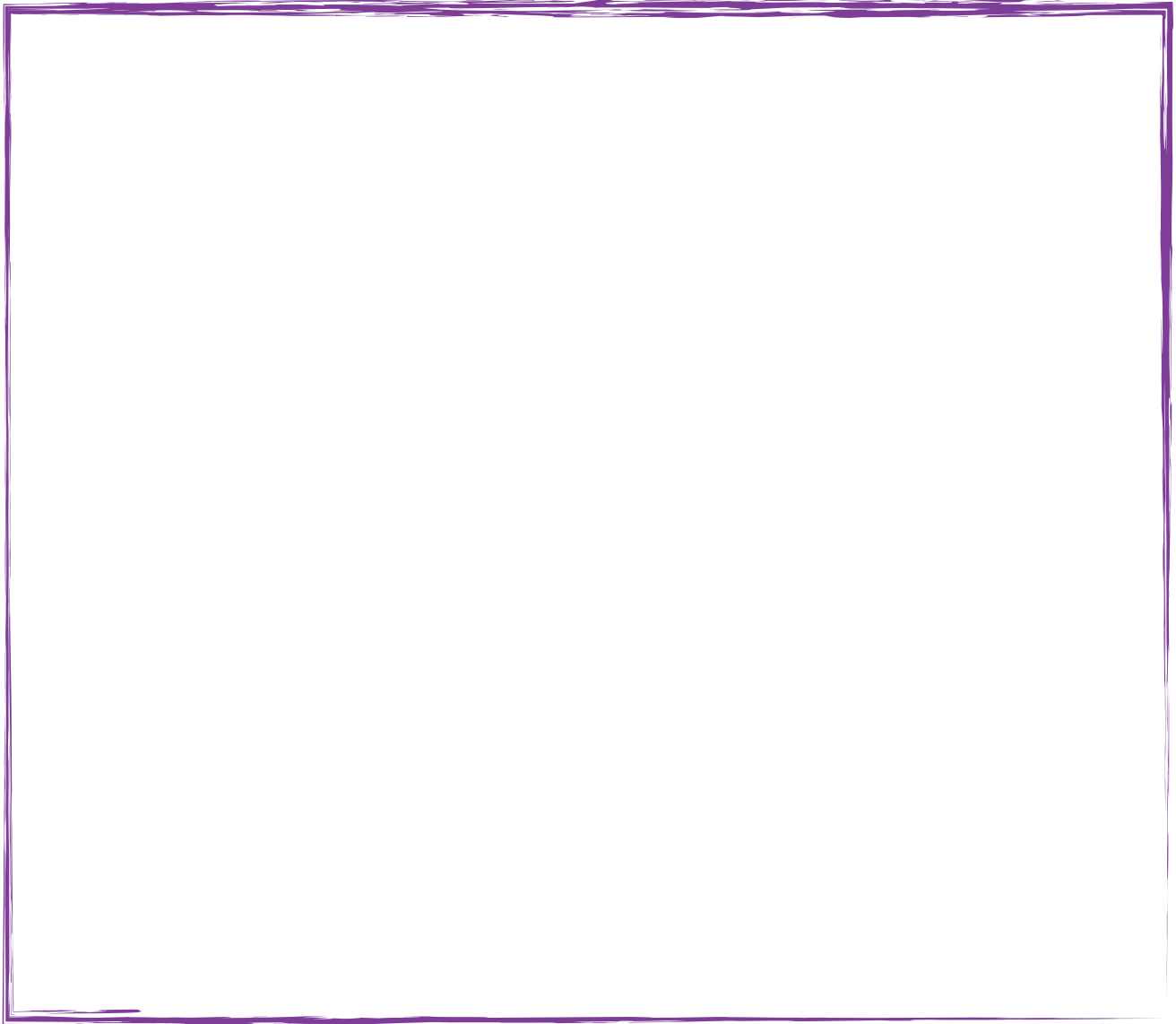
4 + 6 = 13

Name: _____ Date: _____

Extend Learning Task

Directions: Solve.

Todd has 10 blocks. Some blocks are green. Some blocks are blue. How many green blocks and how many blue blocks could he have?



Name: _____ Date: _____

Day 4

Independent Practice

Directions: Find the missing number. Then, color the square.

6 = blue

3 = yellow

7 = green

1 + 9 = 15

2 7 + = 14

3 2 + = 8

4 12 + = 15

5 + 10 = 16

6 8 + = 14

What letter did you make with blue? _____

Name: _____ Date: _____



Swimming Laps

Day 4

Josh swam 5 laps at the pool. Jo swam some laps, too. Together, they swam 16 laps. How many laps did Jo swim?



What Do We Know?



Make a Plan



Solution



Explain How You Know