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**Summer Scholars
Mathematics
Rising 5th Grade**

This sample includes the following:

Management Guide pages

- Cover and Table of Contents (3 pages)
- How to Use This Resource pages (4 pages)
- Grade Level Details pages (7 pages)

Teacher's Guide pages

- Cover (1 page)
- Days 3–4 Overview (1 page)
- Day 3 Lesson (5 pages)
- Day 4 Lesson (3 pages)

Student Guided Practice Book pages

- Cover (1 page)
- Day 3 Student Pages (7 pages)
- Day 4 Student Pages (5 pages)

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SUMMER Scholars

Mathematics

Management Guide



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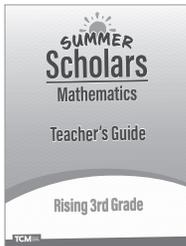
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How to Use This Resource

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.

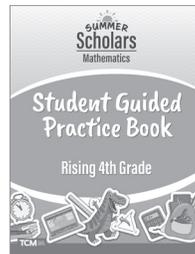
What's Included?

Teacher's Guide



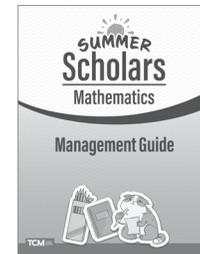
The daily lessons enhance instruction with research-based mathematics instructional practices.

Student Guided Practice Book



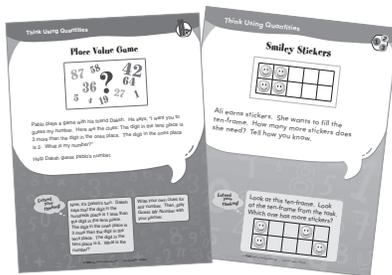
This book encourages students' mathematical fluency with multiple opportunities to apply learning.

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



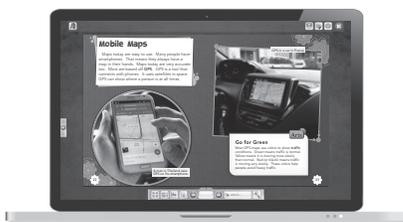
These cards provide rich problem-solving tasks for students to solve and discuss collaboratively. They are provided in both print and digital format.

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 _____.

10 93198—Summer Scholars: Teacher's Guide

Vocabulary Activity

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.)

20 min

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 Reflex 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.

Reflex 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 Reflex 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

- **Reflex Group Practice:** Have students solve Question 2 on Reflex 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.

11 93198—Summer Scholars: Teacher's Guide

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

Assessment opportunities are provided in every lesson.

Day 4

Name: _____ Date: _____

Independent Practice

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.

Day 14

Name: _____ Date: _____

Extend Learning Task

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: | |

© 2018—Summer Scholars: Student Activity

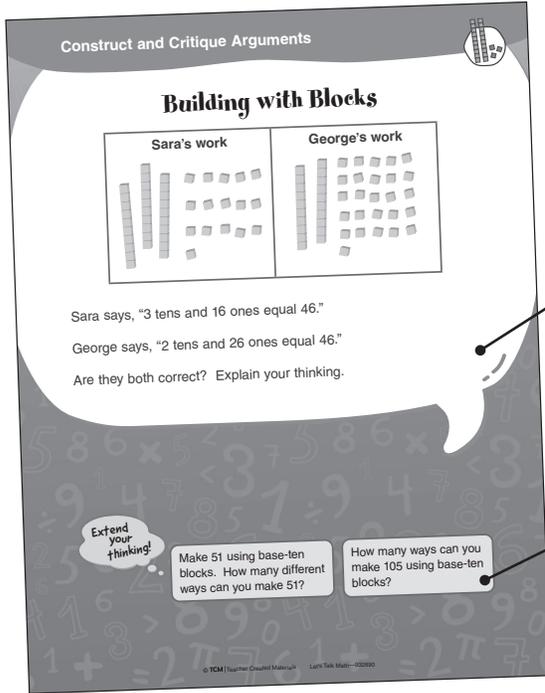
There are many ways for students to access the student activity pages:

- 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.)*

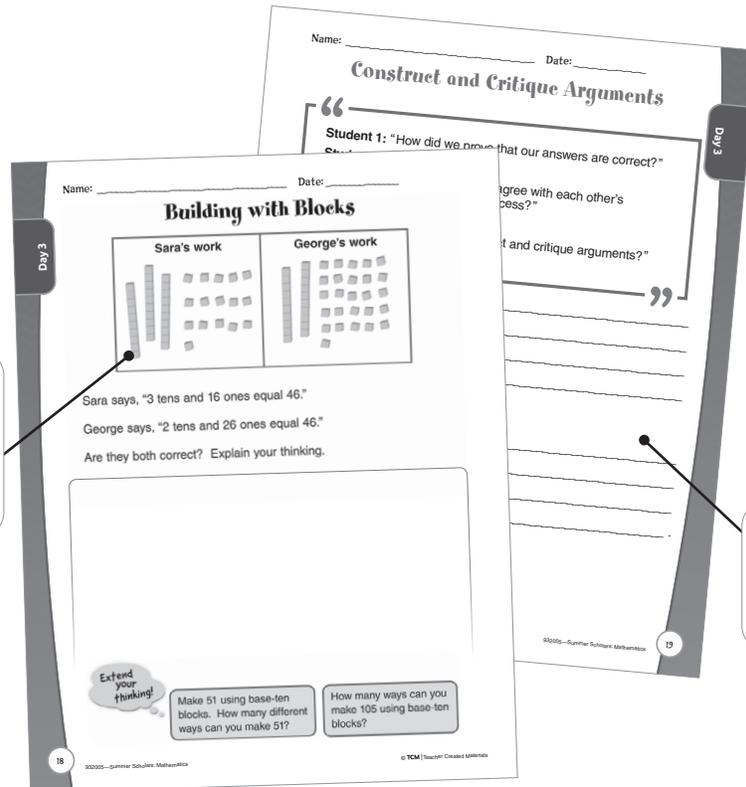
Mathematical Discourse Task Cards

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 know when to use a number or 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?

| 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 5th Grade

Grade Level Details

Rising 5th 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 | Multiplying to Solve Comparison Problems | Multiply to solve real-world problems with fluency, including word problems involving multiplicative comparison. | Think Using Quantities “Fundraiser” | Make sense of quantities and their relationships in problems. | Designing Butterfly Exhibits | Define the Problem | Make sense of problems and plan, solve, justify and evaluate solutions. |
| Day 2 | | | | | | Designing Butterfly Exhibits | |
| Day 3 | Dividing to Solve Comparison Problems | Divide to solve real-world problems with fluency, including word problems involving multiplicative comparison. | Use Tools Strategically “Baseball Cards” | Consider and use available tools when solving problems. | Designing Butterfly Exhibits | Build and Test | Apply mathematics to solve problems arising in everyday life, society, and the workplace. |
| Day 4 | | | | | Designing Butterfly Exhibits | | |
| Day 5 | Finding Factor Pairs | Determine all factor pairs for a whole number in the 1–144 range. | Analyze the Structure “Finding Factors” | Observe closely to discern a pattern or structure in a problem. | Designing Butterfly Exhibits | Reflect and Share | Make sense of problems and plan, solve, justify and evaluate solutions. |
| Day 6 | | | | | Animal Senses | | |
| Day 7 | Rounding Multi-Digit Numbers | Use place value understanding to round multi-digit whole numbers to a given place. | Construct and Critique Arguments “Ellie’s Estimates” | Use assumptions, definitions, and previously established results to construct arguments. | Design and Build | Animal Senses | Apply mathematics to solve problems arising in everyday life, society, and the workplace. |
| Day 8 | | | | | Test and Reflect | | |

Rising 5th 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 | Use strategies and algorithms to multiply a multi-digit whole number by a one-digit whole number with procedural reliability. | Use Tools Strategically "Boxes of Books" | Consider and use available tools when solving problems. | <i>Animal Senses</i> Redesign and Rebuild | Make sense of problems and plan, solve, justify and evaluate solutions. |
| Day 10 | | | | <i>Animal Senses</i> Retest and Share | |
| Day 11 | Use strategies and algorithms to multiply a two-digit whole number by a two or three-digit whole number with procedural reliability. | Construct and Critique Arguments "Using the Area Model" | Use assumptions, definitions, and previously established results to construct arguments. | <i>The Culture of Calendars</i> Define the Problem | Make sense of problems and plan, solve, justify and evaluate solutions. |
| Day 12 | | | | <i>The Culture of Calendars</i> Design | Understand various art forms while planning and carrying out fair tests in which variables are controlled. |
| Day 13 | Use strategies and algorithms to find whole-number quotients with up to four-digit dividends by one-digit divisors with procedural reliability. | Analyze the Structure "Consider the Groups" | Observe closely to discern a pattern or structure in a problem. | <i>The Culture of Calendars</i> Build and Test | Apply mathematics to solve problems arising in everyday life, society, and the workplace. |
| Day 14 | | | | <i>The Culture of Calendars</i> Improve | |
| Day 15 | Compare two fractions with different numerators and different denominators by generating equivalent fractions and represent the comparison using the symbols $>$, $=$, or $<$. | Use Tools Strategically "The Bigger Piece" | Consider and use available tools when solving problems. | <i>The Culture of Calendars</i> Reflect and Share | Make sense of problems and plan, solve, justify and evaluate solutions. |
| Day 16 | Comparing Fractions: Common Denominators | | | <i>Food Webs</i> Learn Content, Understand the Challenge, and Brainstorm | Define a simple design problem reflecting the need or want that includes specified criteria for success. |

Rising 5th 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 |
| Comparing Fractions: Benchmark Numbers | Compare two fractions by using benchmark fractions such as $0, \frac{1}{4}, \frac{1}{2}, \frac{3}{4}$, and 1, and justify the conclusions. | Analyze the Structure "Distance on Number Lines" | Observe closely to discern a pattern or structure in a problem. | <i>Food Webs</i> Design and Build | Apply mathematics to solve problems arising in everyday life, society, and the workplace. |
| | Adding and Subtracting Fractions | Add and subtract fractions with like denominators, including fractions greater than one, understanding that each fraction in an equation refers to the same whole. | Analyze the Structure "Marcie's Milk" | <i>Food Webs</i> Redesign and Rebuild | Make sense of problems and plan, solve, justify and evaluate solutions. |
| Problem Solving with Area and Perimeter | | Apply the area and perimeter formulas for rectangles in real-world problems, including those with unknown side lengths, using whole numbers. | Think Using Quantities "Wanda's Rabbits" | <i>Designing a Shuttle</i> Define the Problem | Make sense of problems and plan, solve, justify and evaluate solutions. |
| | Understanding Geometric Language | Identify and draw points, lines, line segments, rays, angles, and perpendicular and parallel lines in two-dimensional figures. Classify angles and two-dimensional figures based on their attributes. | Construct and Critique Arguments "Common Attributes" | <i>Designing a Shuttle</i> Design | Read and understand multi-digit whole numbers using base-ten numerals and number names. |
| Culminating Activity | | | Use assumptions, definitions, and previously established results to construct arguments. | <i>Designing a Shuttle</i> Build and Test | Apply mathematics to solve problems arising in everyday life, society, and the workplace. |
| | | | | <i>Designing a Shuttle</i> Improve | Make sense of problems and plan, solve, justify and evaluate solutions. |
| Day 17 | | | | | |
| Day 18 | | | | | |
| Day 19 | | | | | |
| Day 20 | | | | | |
| Day 21 | | | | | |
| Day 22 | | | | | |
| Day 23 | | | | | |
| Day 24 | | | | | |
| Day 25 | | | | | |

Rising 5th Grade STEAM Challenges and Materials

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

| Challenge Name | Description | Materials |
|--|---|---|
| <i>Designing Butterfly Exhibits</i> (reader) | Teams build and design butterfly feeders to attract local butterflies. | <ul style="list-style-type: none"> • classroom supplies (markers and scissors) • cardboard pieces and rolls • craft sticks • masking tape • paper bags • paper cartons • paper plates • sponges • string or twine |
| Animal Senses | Students create devices that use sound to help an injured animal protect itself. | <ul style="list-style-type: none"> • beads (a handful) • craft sticks (10–15) • popcorn seeds (a handful) • rubber bands (5–10) • balloons (2) • foil • cardboard rolls (3–4) • paper cups (3–4) • pipe cleaners (5–10) • string (3–4 ft., 1 m) |
| <i>The Culture of Calendars</i> (reader) | Teams build visually-pleasing sculptures that can also tell the time of day from their shadows. | <ul style="list-style-type: none"> • classroom supplies (crayons or colored pencils and a ruler) • cardboard pieces • flashlight • modeling clay • paper plates • paper towel rolls • rocks • straws |
| Food Webs | Students create model ocean or rain forest ecosystems. | <ul style="list-style-type: none"> • cardboard tubes (5–10) • construction paper • craft sticks (10–20) • modeling clay • pipe cleaners (10–15) • shoebox with lid • string (2–3 ft., 60–90 cm) |
| <i>Designing a Shuttle</i> (reader) | Teams design and build model shuttles that can be launched with straws. | <ul style="list-style-type: none"> • paper • flexible drinking straws • meter stick or measuring tape • scissors • tape |

Rising 5th 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>Adaptations</i> | 770L | U | Giraffes have long necks. Polar bears have thick fur and large feet. Octopuses change colors. All of these are adaptations. Whether animals are hiding from predators or are catching prey, adaptations are important. |
| <i>Animal Senses</i> | 780L | Q | Smell, sight, sound, touch, and taste . . . these are our senses. They help us understand the world around us. But what about animals? Can cats taste ice cream? Can fish hear sounds underwater? Learn more about how animals sense the world around them. |
| <i>Abstract Art: Lines, Rays, and Angles</i> | 660L | W | Meet the masters of abstract art! Josef Albers, Wassily Kandinsky, and Sophie Taeuber-Arp helped form the world of modern art. They created a movement that celebrates simple shapes. Explore lines, rays, and angles—the math behind modern art—as you learn about each artist. |
| <i>CSI</i> | 750L | W | Throughout this reader, students experience the mystery and intrigue of crime scene investigation. The reader focuses on different types of data that investigators collect to solve a case. Students will examine fingerprints, blood type, DNA, and lie detectors. |
| <i>Light and Its Effects</i> | 720L | U | Light can travel faster than anything else in the universe. It makes it possible for you to wear a differently colored shirt every day. But what exactly is light, and where does it come from? One thing is for sure—light makes our world a brighter place. |
| <i>Filmmakers: Adding and Subtracting Mixed Numbers</i> | 740L | W | “Quiet on the set! And . . . ACTION!” Meet some of today’s leading filmmakers, and find out how they tackle challenges and solve problems. Strategize as you add and subtract mixed numbers while learning about the art of filmmaking. |

Rising 5th Grade Classroom Library Information *(cont.)*

| Book Title | Lexile® Measure | *Guided Reading Level | Summary |
|---|-----------------|-----------------------|---|
| <i>The Hidden World of Toilets: Volume</i> | 740L | W | Lift the lid off the hidden world of toilets! Examine the history and inner workings, and peek at toilets around the world. Solve problems with volume, and find out why solving the problem of clean toilets for developing countries should be a worldwide priority. |
| <i>The History of Telephones: Fractions</i> | 710L | T | From Alexander Graham Bell to Steve Jobs, creative thinkers have revolutionized the way we communicate. Come aboard a young innovator's time machine as he explores the history of the telephone, one fraction at a time! |
| <i>The Rock Cycle</i> | 750L | T | Rocks may not look like they are doing much. But they are always forming, destructing, and recycling. Different types of rocks form in different ways. And different types of rocks have a variety of uses. Take a journey through the rock cycle, and stand in rock-solid awe of our planet. |
| <i>We Are Here</i> | 710L | S | Humans are like tiny specks compared to Earth. And Earth is like a tiny speck compared to the universe. Words cannot describe how massive our universe really is. It's difficult to imagine that we're really so small. Even though we might be small compared to the universe, we are still part of this complex and fascinating system. |

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



SUMMER Scholars

Mathematics

Teacher's Guide

Rising 5th Grade

Days 3–4 Overview

Dividing to Solve Comparison Problems

Learning Outcome

- Divide to solve word problems involving multiplicative comparison (e.g., by using drawings and equations).

Focus

The following lesson will address this focus question: *What strategies can you use to solve word problems?* You may wish to write the focus question on the board or chart paper and read it aloud to students.

Teacher Background

In previous grades, students have solved additive comparison situations with addition and subtraction. Now, students will solve multiplicative comparison situations using division. In this lesson, students will work with word problems involving an unknown group size. For example: *The blue bike costs \$60.00. That is three times more than the red bike. How much does the red bike cost? ($\$60.00 \div 3 = ?$)*

.....

Mathematical Discourse

Learning Outcome

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

Designing Butterfly Exhibits

Learning Outcome

- Use mathematical knowledge to build and improve upon an engineering design.

Materials

- | | | |
|---|--|--|
| • <i>Student Guided Practice Book</i> (pages 16–27) | • <i>Designing Butterfly Exhibits</i> book | • markers |
| • <i>Baseball Cards</i> task card | • index cards | • sticky notes |
| | • chart paper | • connecting cubes (or other counting manipulatives) |

Materials per STEAM Group

- | | | |
|---|-----------------|-------------------|
| • classroom supplies (markers and scissors) | • masking tape | • paper plates |
| • cardboard pieces and rolls | • paper bags | • sponges |
| • craft sticks | • paper cartons | • string or twine |

Dividing to Solve Comparison Problems

Warm-Up

1. Pair students together. Provide each pair with a stack of index cards labeled 1–10.
2. On the board or chart paper, write division equations with either the divisor or the quotient missing. For example, write $15 \div \square = 5$. Have pairs work together to determine the missing number. Students will face the front of the room and place a number card with the missing number on their forehead. The answer will be visible to you, but not their classmates.
3. When every pair has an answer, ask, “What number can we divide 15 by to result in a quotient of 5?” Have students turn in their chairs to look at the number each pair chose as the missing factor.
4. Continue play with other similar problems. For example, write: $32 \div 8 = \square$; $60 \div \square = 6$; $21 \div 3 = \square$; $45 \div 5 = \square$; $16 \div \square = 8$.

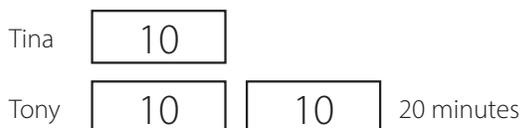
Language and Vocabulary

1. Make a chart by dividing a sheet of chart paper into three columns. Label the columns *Vocabulary Word*, *Definition*, and *Example/ Drawing*. In the first column, write the following words:
 divide
 equation
 quotient
2. Review each word with students, and write the definition in the appropriate column on the chart paper.
3. Place students into groups of three. Distribute three sticky notes to each group. Ask each group to write examples and/or draw pictures for each word on the sticky notes.
4. When groups are finished, have them place the sticky notes in the correct column on the chart. Review the examples and drawings with the class. Keep the chart paper posted for the duration of the lesson or unit.

Dividing to Solve Comparison Problems

I Do

- Say, "Today, we are going to solve word problems." Write the following problem on the board or chart paper. Read the problem as you write: *Tony rode his skateboard for 20 minutes. That is two times as long as Tina rode her skateboard. How many minutes did Tina ride her skateboard?*
- Ask, "What do we know from the problem? What do we need to find out?" (*They know Tony rode for 20 minutes, two times as long as Tina. They need to find out how long Tina rode her skateboard.*)
- Say, "We need a plan to solve. We can use a visual model called a bar model to show these two amounts. To create the bar model, let's think about what we know. The problem says that Tony rode for two times as long as Tina. So I will start by drawing two bars (rectangles) for Tony and one bar for Tina. The bars will all be the same size because they have the same value. This shows Tony rode for two times as long." Draw the model on the board or chart paper, and label each row with the correct name.
- Ask, "How long did Tony ride his skateboard?" (*20 minutes*) Write *20 minutes* beside the two bars on the row labeled *Tony*. Ask, "If these two bars together represent 20 minutes, how much would one bar equal?" If needed, help students recognize that they need to divide 20 by 2 to find what each bar represents. Students should arrive at a quotient of *10*.
- Write *10* in each of the bars on Tony's row. You may wish to confirm that your quotient is accurate by counting by tens for each bar (*10, 20*), showing that you reach a total of 20. Say, "We can also fill in the bar on Tina's row. The bars must have the same value, so we will also label her bar *10*." Write *10* in Tina's bar. Help students identify that this means Tina rode her skateboard for 10 minutes.
- Say, "Now, let's write an equation to show what we did with the model. What operation did we use to complete the model?" If needed, help students recognize that they took a total (20) and divided it evenly into two groups. This can be shown with the division equation $20 \div 2 = 10$. Record the equation on the board or chart paper. Also, record the solution. (*Tina rode her skateboard for 10 minutes.*)
- Say, "Let's look back at the problem to see if our solution makes sense. It says that Tony rode for two times as long as Tina. We said that Tina rode for 10 minutes. Is 20 minutes two times as long as 10 minutes?" (*Yes.*) Refer students back to the equation you wrote. Say, "This equation says 20 divided by 2 is 10. We can also think of this as 20 is two times as many as 10."



Dividing to Solve Comparison Problems

We Do

1. Display *Healthy Choices* from page 16 of the *Student Guided Practice Book*. Say, "Let's look at another problem together." First, have a student read the problem: *Jose wants to drink more water. On Tuesday, he drank 30 ounces of water. That is five times more than he drank on Monday. How many ounces did he drink on Monday?*
2. Ask, "What information do we know? What do we need to find out?" (*We know Jose drank 30 ounces of water on Tuesday, and that is five times more water than he drank on Monday. We need to find out how many ounces of water he drank on Monday.*)
3. Ask, "How can we create a bar model to represent this problem?" (*by labeling rows for Monday and Tuesday*) Say, "In the row for Monday, there will be one empty bar. In the row for Tuesday, there will be five empty bars. This shows five times as many on Tuesday." Have students draw this on the activity sheet. You can also draw the model on the board or chart paper, or on a display copy of the activity sheet.
4. Ask, "How many total ounces of water did Jose drink on Tuesday? Where should we write this information?" (*We can record 30 ounces beside the row for Tuesday.*)
5. Ask, "What should we do next?" (*We need to determine the value of each bar.*) Guide them to recognize that if all five bars on the row for Tuesday equal 30, they can divide 30 by 5 to find the value of each bar. After students recognize a quotient of 6, have them record the number in each of the bars. Students should reason that the bar on the row for Monday should also be labeled 6 because every bar in the model needs to have the same value. Label the bars on your display model as well.
6. Have students record the equation that shows what they did with the model ($30 \div 5 = 6$), write the solution (*Jose drank six ounces of water on Monday.*), and explain their solution. To help students explain their reasoning, provide them with the following sentence frames:
 - *I used a bar model to solve by _____.*
 - *I wrote the equation _____ . This means that 30 is the same as _____ times as many as _____.*
7. If time allows, repeat the procedure in Steps 1–6 to solve Question 2. ($27 \div 3 = 9$; *Ada brought nine orange slices to the game last week.*)

Support for Language Learners: Ask students to circle words they do not understand in the problems. Circulate around the room to see which words students have circled and define or clarify the meanings of the words for the class without drawing attention to individual students.

You Do

1. Display *Making a Difference* from page 17 of the *Student Guided Practice Book*. Provide the sentence frames from Step 6 of the We Do section to help students explain their reasoning.
2. Have students share their bar models and reasoning. If students have difficulty explaining their reasoning, remind them to use the sentence frames and vocabulary terms.

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 your brain. The word *strategically* is emphasized because sometimes mathematicians 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 *Baseball Cards* 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 work through 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 extensions on the next day.)

Answer: Carrie's brother has 392 baseball cards. Tool selection will vary.

Possible Misconception: Students who can recite the number facts may not be able to apply this knowledge in varying contexts because they do not understand the meaning of multiplication.

Language Support

- **Tier 3:** area models, tape diagrams, bar models, equation, number lines, manipulatives
- **Tier 2:** select, solve, problem, tool
- **Tier 1:** drawings, baseball cards

Students may have difficulty understanding the phrase *times as many*. Provide assistance as needed.

Scaffolding

Ask students to consider the same problem but with simpler values. For example, Carrie has 10 baseball cards. Her brother has 7 times as many. How many cards does he have? Then, ask students to solve the original task.

Designing Butterfly Exhibits

Materials and Preparation

- Prepare a set of supplies for each group (markers, scissors, cardboard pieces/rolls, craft sticks, masking tape, paper bags, paper cartons, paper plates, sponges, string or twine).
- Plan to conduct tests in an indoor or outdoor area where students can hang or stand butterfly feeders.

Read Aloud

1. Review the information from the previous day's read aloud.
2. Read another section of the *Designing Butterfly Exhibits* book. Pause periodically to discuss new information and any questions students may have.

Build

1. Have groups review their *Collaborative Design* from page 15 of the *Student Guided Practice Book*. Explain to students that when they work with their groups to build the butterfly exhibits, they must follow their team's design plans. Reassure them that they will have an opportunity to change and improve their designs after they present them.
2. Review classroom expectations for working with materials. Then, give teams time to build their model of the butterfly exhibit.
3. Have students complete Questions 1 and 2 on *Think about It* from page 20 of the *Student Guided Practice Book*. Explain that reflection is an important part of the engineering design process. After students have completed the first two questions of *Think about It*, ask volunteers to share their responses.

Test

1. Gather teams for testing. Invite teams to bring their butterfly feeders to an area where they can hang or stand their feeders and adjust them.
2. Explain that teams will offer feedback after each test. Use *Friendly Feedback* from page 21 of the *Student Guided Practice Book* to review best practices for giving feedback.
3. Display *Butterfly Feeder Test Results* from page 22 of the *Student Guided Practice Book*. Ask students to record results for each team.
4. Give time for each team to test. Ask teams to present their designs to their peers and explain how the feeders will work. Then, have teams set up their feeders and adjust them to a new height.
5. Tell students that teams will brainstorm ways to improve their designs on the next day of instruction.

Dividing to Solve Comparison Problems

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. Provide students with unlined paper to show their work on the selected response questions.
2. Based on the results of *Quick Check* and your observations during the lesson, identify students who may benefit from additional instruction in the learning outcomes. These students will be placed into 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 Activity while the first group completes the Practice activity.

Refocus

1. Provide students with connecting cubes. On the board or chart paper, write: *Ari has 10 blue shirts. That is two times the number of green shirts that she has. How many green shirts does Ari have?* Have students link 10 cubes together to represent the blue shirts.
2. Point out that this is two times the number of green shirts, so students can make two equal groups with 10 cubes to show the number of green shirts. Have students split the 10 cubes into two equal groups. (*five cubes in each group*) Guide them to recognize that Ari has five green shirts. Write the corresponding division equation ($10 \div 2 = 5$) on the board or chart paper and look back at the question to see if your answer is reasonable. (*Yes, Ari has five green shirts; two times five is 10, which is the number of blue shirts she has.*)
3. Support students as they complete the first question on *Refocus* from page 24 of the *Student Guided Practice Book*. They should use cubes to model.

Extend

1. Write the following problem on the board or chart paper: *Paul is 40 years old. That is four times older than Dan. How old is Dan?* Use a bar model to identify the division equation ($40 \div 4 = ?$), and model how to consider the related multiplication fact. ($4 \times ? = 40$) Connect this to the bar model for the problem, explaining how the bar model shows equal groups.
2. Have students complete *Extend Learning Task* from page 25 of the *Student Guided Practice Book*. They will write their own division word problems and solve.

Practice

- **Refocus Group Practice:** Have this group solve Question 2 on *Refocus* from page 24 of the *Student Guided Practice Book* to reinforce their learning.
- **Extension Group Practice:** Have this group complete *Independent Practice* from page 26 of the *Student Guided Practice Book* to reinforce their learning.

Dividing to Solve Comparison Problems

Math in the Real World

1. Display *Math in the Real World: Erin Exercises* 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 aloud. Students should identify that they know Erin exercised for 30 minutes on Wednesday, which is three times longer than on Tuesday. They also know that on Tuesday, she exercised for twice as long as on Monday. Students need to find out how long she exercised on Monday. 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 bar model to help you solve this problem? Do you need to use more than one bar model to find the answer?
 - What equations can you use to help you solve?
4. Observe how students are solving the task and choose a few groups who solved the task in different ways to share their solutions and reasoning. Try to have the solutions move from concrete representations to more abstract representations. For example, have students share solutions with the visual representation (bar models), then the symbolic representation (multiplication equations). Note that two models and two equations are needed (one to determine the number of minutes exercised on Tuesday; one to determine the number of minutes exercised on Monday). Make sure students explain their reasoning as they share solutions.
5. As groups are sharing their solution paths, reasoning, and strategies, ask questions:
 - Do you agree or disagree with the solution path and reasoning? Why?
 - Which solution path makes the most sense to you? Why?

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

- *I used a bar model to _____. Then, I used another bar model to _____.*
- *The equation _____ means _____ is _____ times as many as _____.*

Use Tools Strategically

Mathematical Discourse Card Extensions

1. Allow time for students to complete the routines for the *Baseball Cards* task from the previous day.
2. Have students work in pairs to complete the extensions.
 - Carrie has some football cards. Her brother has 8 times as many football cards. They have a total of 576 cards. How many football cards does her brother have? (*512 cards*)
 - Carrie's brother has 7 times as many soccer cards as she has. Together, they have 576 soccer cards. How many soccer cards does Carrie have? (*72 cards*)

Designing Butterfly Exhibits

STEAM Challenge

Materials and Preparation

- Prepare supplies for rebuilding (markers, scissors, cardboard pieces/rolls, craft sticks, masking tape, paper bags, paper cartons, paper plates, sponges, string, or twine).

Read Aloud

1. Review information from the previous day's read aloud.
2. Read another section or a few pages of the *Designing Butterfly Exhibits* book. Pause periodically to discuss new information and any questions students may have.

Improve

1. Have teams 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 *Collaborative Design* from page 15 of the *Student Guided Practice Book*. Ask them to sketch their improved designs and explain any changes. Have students submit improved designs for approval before working on their model.
3. Have teams gather materials to improve their designs. Then, have them retest their feeders.
4. Have students answer Questions 3 and 4 on *Think about It* from page 20 of the *Student Guided Practice Book* to reflect.

SUMMER
Scholars
Mathematics

Student Guided Practice Book

Rising 5th Grade



Name: _____ Date: _____

Healthy Choices



Day 3

Directions: Solve. Draw a bar model and write an equation.

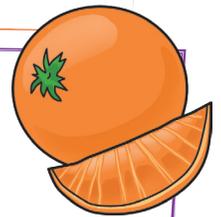
- 1 Jose wants to drink more water. On Tuesday, he drank 30 ounces of water. That is five times more than he drank on Monday. How many ounces did he drink on Monday?

Equation: _____

Solution: _____

 **Explain your solution.**

- 2 Ada brings orange slices to her soccer games. This week, she brought 27 orange slices. That is three times more than she brought last week. How many orange slices did she bring last week?



Equation: _____

Solution: _____

 **Explain your solution.**

Name: _____ Date: _____

Making a Difference

Directions: Solve. Draw a bar model and write an equation.

Day 3

- 1 Kali and Ty are picking up trash in the park. Ty picks up 28 pieces of trash, which is four times the amount Kali picks up. How many pieces of trash does Kali pick up?

Equation: _____

Solution: _____

- 2 Mei is raising money for the animal shelter. This week, she earns \$50.00 doing yard work for her neighbors. She is happy because that is 10 times more than what she earned last week. How much did she earn last week?

Equation: _____

Solution: _____



Choose Question 1 or 2. Explain your solution.



Baseball Cards

Carrie has 56 baseball cards. Her brother has 7 times as many. How many cards does he have?

Select a tool, and solve this problem. Consider using paper and pencil, an equation, drawings, area models, tape diagrams or bar models, number lines, manipulatives, or another tool.



Extend your thinking!

Carrie has some football cards. Her brother has 8 times as many football cards. They have a total of 576 cards. How many football cards does her brother have?

Carrie's brother has 7 times as many soccer cards as she has. Together, they have 576 soccer cards. How many soccer cards does Carrie have?

Name: _____ Date: _____

Think about It

Day 3

1. What did your team struggle with? How did you deal with it? _____

2. How did you contribute to your team? _____

3. How did you use science, technology, engineering, the arts, and/or math in your designs? _____

4. What was successful about your first design? How did you improve it? _____

5. What is the most important thing you learned? What questions do you still have?

Name: _____ Date: _____

Friendly Feedback

Directions: Feedback can help people improve work. Use these sentence stems to give feedback to your peers.

Day 3

Clarify

Can you explain _____ ?

Why did you choose to _____ ?

How did you _____ ?

Warm Feedback

I like _____ because _____ .

It is interesting that _____ .

_____ is a good idea because _____ .

Cool Feedback

Have you thought about _____ ?

I wonder if _____ .

You might want to try _____ .

Name: _____ Date: _____

Butterfly Feeder Test Results

Day 3

Directions: Write the materials each team used. Explain how feeders attract butterflies. Mark the results of each team's test by circling yes or no. Then, answer the question.

| Team | Recycled Materials Used | How does the feeder attract butterflies? | Can the feeder be adjusted to two heights? |
|------|-------------------------|--|--|
| | | | yes/no |

How can you improve your feeder to attract butterflies in different ways?

Quick Check

Directions: Choose an equation that matches the word problem.

1 Eva made 36 bracelets. That is four times the number of necklaces that she made. How many necklaces did she make?

A $36 + 4 = \square$

B $\square = 36 \div 4$

C $4 \times 36 = \square$

D $9 + 3 = \square$

2 Amin has 18 model cars in his collection. That is three times the number his little brother has. How many model cars does Amin's brother have?

A $6 \div 3 = \square$

B $18 + 3 = \square$

C $\square = 3 \times 18$

D $18 \div 3 = \square$

Directions: Solve.

3 There are 42 students on the playground. That is six times more than the number of students in the classroom. How many students are in the classroom?

Equation: _____

Solution: _____

Explain your solution.

Name: _____ Date: _____

Refocus

Day 4

Directions: Solve each problem. Use cubes to model.



- 1 There are 12 bluebirds in a tree. This is two times as many as the number of blackbirds. How many blackbirds are there?

Equation: _____

Solution: _____

-  Explain how you used cubes to model.

- 2 Gina collected 15 leaves on a nature walk. That is three times the number of rocks that she collected. How many rocks did she collect?

Equation: _____

Solution: _____

-  Explain how you used cubes to model.

Name: _____ Date: _____

Extend Learning Task

Directions: Solve each problem.

Day 4

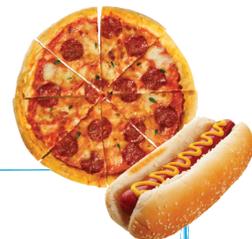
- 1 At the water park, there are 72 kids on water slides. That is nine times the number of kids in the wave pool. How many kids are in the wave pool?

Division equation: _____

Related multiplication equation: _____

Solution: _____

- 2 64 hot dogs were sold at the snack bar. That is eight times the number of pizzas. How many pizzas were sold?



Division equation: _____

Related multiplication equation: _____

Solution: _____

Name: _____ Date: _____

Independent Practice



Day 4

Directions: Solve. Draw a bar model and write an equation.

- 1 24 horses run in the field. That is four times the number of horses in the stable. How many horses are in the stable?

Equation: _____

Solution: _____

- 2 Taj has 55 baseball cards. That is five times the number of baseball caps that he has. How many baseball caps does he have?

Equation: _____

Solution: _____

- 3 54 students went on a field trip. That is six times the number of adults on the trip. How many adults went on the field trip?

Equation: _____

Solution: _____



Erin Exercises



Erin exercised for 30 minutes on Wednesday. That is three times longer than she exercised on Tuesday. On Tuesday, she exercised for twice as long as she did on Monday. How long did she exercise on Monday?



Unpack the Problem



Make a Plan



Solution



Look Back and Explain