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## Summer Scholars Mathematics Rising 8th Grade

### Management Guide pages

- Cover and Table of Contents (3 pages)
- How to Use This Resource pages (6 pages)
- Grade Level Details pages (7 pages)

### Teacher's Guide pages

- Cover (1 page)
- Days 1–2 Overview (1 page)
- Day 1 Lesson (5 pages)
- Day 2 Lesson (3 pages)

### Student Guided Practice Book pages

- Cover (1 page)
- Day 1 Student Pages (5 pages)
- Day 2 Student Pages (6 pages)

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# SUMMER Scholars

## Mathematics

# Management Guide

Rising 7th and Rising 8th Grades



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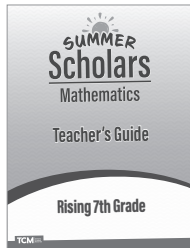
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# How to Use This Resource

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.

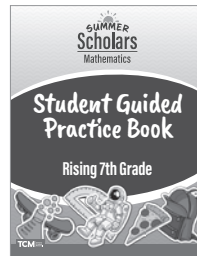
## What's Included?

### Teacher's Guide



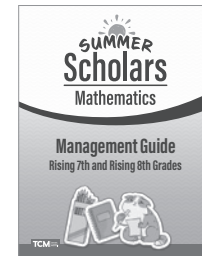
The daily lessons enhance instruction with research-based mathematics instructional practices.

### Student Guided Practice Book



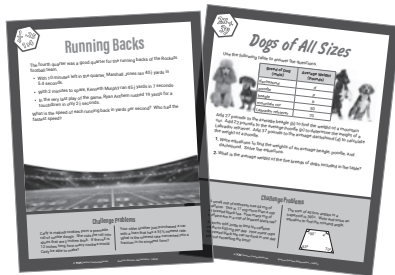
This book encourages students' mathematical fluency with multiple opportunities to apply learning.

### Management Guide



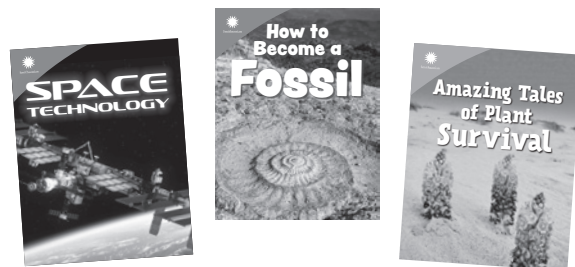
This guide helps teachers plan effectively with flexible lesson pacing and a scope and sequence designed specifically for varied summer settings.

## 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 7**  
**Rational Numbers**



### Order of Rational Numbers

**Warm-Up**  

- Before the lesson, write integers on sticky notes. There should be enough sticky notes for each student to have one. The integers should not be consecutive and should include positive and negative numbers and zero.
- Give a sticky note to each student. Have students line up in order from least to greatest without talking by displaying their notes to each other.
- When students have finished, have them say their numbers, beginning with the least number. Have them post their notes on the board or on chart paper in order and then be seated.
- Choose a negative number, and ask students to describe the distance the number is from zero. Ask, "Is the number less than or greater than zero?" (less than) Now choose a positive number, and say, "Describe the distance the number is from zero. Is the number less than or greater than zero?" (greater than) Say, "Let's compare these two numbers. Which number is greater? Which number is less? How can we write an inequality for these numbers using a less-than symbol? How can we write an inequality for these numbers using a greater-than symbol? Write both inequalities on the board or on chart paper. Emphasize the correct way to read and write the inequality."

**Language and Vocabulary** 

- Prior to class, prepare three sheets of chart paper, one titled Negative, one titled Zero, and one titled Positive. Write the following vocabulary terms on the board or on chart paper:
  - equal to
  - inequality
  - greater than
  - less than
- Ask students to explain what *greater than* means and write the symbol. They should know that greater than means that a number has a bigger value and is expressed using the symbol  $>$ . Ask students what *less than* means and write the symbol. They should know that less than means that the number has a smaller value and is expressed using the symbol  $<$ . Ask, "When do we choose  $=$ ?" (When two numbers have the same value.)
- Group students in pairs, and give each student a sticky note to each pair. Say, "I'll be a profit, loss, and breaking even!" Write an example of the use of number, the use of a negative, the use of zero. (Students might say loss and  $-100$ , break even and profit and 300.)
- Invite pairs of students to attach their sticky notes to the board. If they have placed their sticky notes, explain their reasonings.

**Language**  

Integers on sticky notes should be enough sticky notes for each student to have one. The integers should not be consecutive and should include positive and negative numbers and zero.



- Prior to class, prepare three sheets of chart paper, one titled Negative, one titled Zero, and one titled Positive. Write the following vocabulary terms on the board or on chart paper:
  - equal to
  - inequality
  - greater than
  - less than

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


Stopwatch icons indicate suggested durations.

**Day 7**  
**Rational Numbers**

### Order of Rational Numbers

**We Do**  

- Display *Hot and Cold* from page 39 of the *Student Guided Practice Book*. Say, "Let's look at another example." Students will begin by writing two inequalities for the two warmest temperatures. Ask, "What are the two warmest temperatures in the list?" (The two positive temperatures are warmer than the negative temperatures.) Ask, "How can we compare these temperatures using an inequality sign?" Guide students to write the inequalities  $145 > 20$  and  $20 < 145$ . Ask, "How can we write a sentence using the these inequalities to explain what the inequalities mean?" (The temperature 145 degrees is warmer than 20 degrees. The temperature 20 degrees is cooler than 145 degrees.)
- Say, "Identify the two coldest temperatures. How can we determine which is colder?" (The negative temperatures are the coldest.) Ask, "How can we compare these temperatures using an inequality sign?" Guide students to write the inequalities  $-80 < -60$  and  $-60 > -80$ . Ask, "How can we write a sentence using the these inequalities to explain what the inequalities mean?" (The temperature -80 degrees is colder than -60 degrees. The temperature -60 degrees is warmer than -80 degrees.)

**You Do** 

- Have students complete *Business Plan* from page 40 of the *Student Guided Practice Book*. Provide the sentence frames from step 4 of the *We Do* section of the lesson to help students explain their reasonings.
- Have students share their inequalities and reasonings. If students have difficulty explaining their reasonings, remind them to use the sentence frames and vocabulary terms.

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

Assessment opportunities are provided in every lesson.

**Day 7**

Name: \_\_\_\_\_ Date: \_\_\_\_\_

### Business Plan

Directions: Use the predictions given to solve the questions.  
Loss of \$5,000.00 Profit of \$150,000.00 Profit of \$50,000.00 Loss of \$15,000.00, Breaking Even

Ms. Guthrie is opening a business. She has the following predictions:

**Day 7**

Name: \_\_\_\_\_ Date: \_\_\_\_\_

### Hot and Cold

Directions: Use the temperatures given to answer the questions.  
 $145^{\circ}\text{C}$ ,  $-80^{\circ}\text{C}$ ,  $-60^{\circ}\text{C}$ ,  $20^{\circ}\text{C}$   
On the Celsius temperature scale,  $0^{\circ}\text{C}$  is the temperature at which water freezes. The temperature at which water boils is  $100^{\circ}\text{C}$ .

- Write an inequality to compare the two warmest temperatures.
- Write a sentence to explain your inequality using the words warmer and cooler.
- Write an inequality to compare the two coldest temperatures.
- Write a sentence to explain your inequality using the words warmer and cooler.
- Write an inequality to compare the warmest and coldest temperatures.
- Write a sentence to explain your inequality using the words warmer and cooler.

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 33 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. They include two challenge problems.

**3D PRINTING**

Jackson is using a 3D printer to make a model house. The house is made with a rectangular prism for the body and a square pyramid for the roof.

- The roof has a height of 3 cm.
- The prism's length and width are 5 cm each.
- The triangular faces of the roof all have a slant height of 4 cm.

If Jackson needs  $240 \text{ cm}^3$  of plastic for printing, what is the missing dimension (height) of the rectangular prism?

Jackson decides that he does not like the color of the printing plastic he chose and decides that he needs to paint the model house. If he uses 2 coats of paint on all exposed faces, what is the total surface area that will be covered?

**Challenge Problems**

Kai is building a table. He has  $480 \text{ inches}^2$  of wood for the table legs. The wood is one long piece. The length and width are both 2 inches. How long will each table leg be?

Lily is painting the trapezoid-shaped faces of a birdhouse that is in the shape of a trapezoidal prism. The parallel sides of the trapezoid's faces are 15 cm and 20 cm long. If she uses  $640 \text{ cm}^2$  to paint the two trapezoids, what would be the height of the trapezoids?

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Cards can be displayed for the whole class.

Challenge problems ask students to think more deeply about the mathematical concept.

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

Day 19

Name: \_\_\_\_\_ Date: \_\_\_\_\_

**3D PRINTING**

Jackson is using a 3D printer to make a model house. The house is made with a rectangular prism for the body and a square pyramid for the roof.

- The roof has a height of 3 cm.
- The prism's length and width are 5 cm each.
- The triangular faces of the roof all have a slant height of 4 cm.

If Jackson needs  $240 \text{ cm}^3$  of plastic for printing, what is the missing dimension (height) of the rectangular prism?

Jackson decides that he does not like the color of the printing plastic he chose and decides that he needs to paint the model house. If he uses 2 coats of paint on all exposed faces, how much surface area will Jackson end up painting?

**Challenge Problems**

Kai is building a table. He has  $480 \text{ inches}^2$  of wood for the table legs. The wood is one long piece. The length and width are both 2 inches. How long will each table leg be?

Lily is painting the trapezoid-shaped faces of a birdhouse that is in the shape of a trapezoidal prism. The parallel sides of the trapezoid's faces are 15 cm and 20 cm long. If she uses  $640 \text{ cm}^2$  to paint the two trapezoids, what would be the height of the trapezoids?

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# 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**  
You are a volunteer at a zoo in your area. The staff at the zoo has asked you to create a new food enrichment toy that can be used in one of the primate (monkey, ape, lemur) enclosures at the zoo. You get to choose which primate you create the enrichment toy for.

**Constraints:** You may only use the materials provided to you.

**Criteria:** Your enrichment toy must create a challenge for the animal to get food. Also, it must be appropriate for the primate based on their behaviors, diet, and overall needs.

**Research and Brainstorm**  
What type of primate will you create the food enrichment toy for? What types of food enrichment items are used in zoos for different primates? What do you like and dislike about those designs? What will be challenging or stimulating about the toy you create?

**Design and Build**  
Sketch two or more designs for your food enrichment toy. Label the parts and the materials. Choose the design you think will work best and be most stimulating for the animal. Then, build your enrichment toy.

**Test and Improve**  
Place items in your enrichment toy to represent the animal's food or treats (small pebbles, beads, etc.). Show it to others. Explain how it works and why it would be a good source of enrichment for the primate you chose. Then, model how it works. Would it be easy for a zoo employee to prepare? Would it be challenging and stimulating for the animal to use? How can you make it better? Modify your design and rebuild it as needed. Reassess how well it meets the criteria.

**Reflect and Share**  
Was your second design better than your first? How do you know? What surprises or problems did you encounter during this challenge? How did you solve them?

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Day 1

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

Students reflect on the process and their final products.

**Animal Health at the Zoo**

**Materials and Preparation**  
• Prepare supplies for groups to use while building (beads, 3 cardboard tubes, construction paper, 10 craft sticks, 2 empty water bottles, 6 paper cups, 6 paper plates, 3 feet of string, masking tape).

**Read Aloud**  
1. Review the information from the previous day's read-aloud.  
2. Read another section of the *Animal Health at the Zoo* book. Pause periodically to discuss new information and questions students may have.

**Build**  
1. Explain to students that when they build their models, they must follow their team design plans exactly. Explain that they will have an opportunity to change or improve their designs after they present them.  
2. Review classroom expectations for working with materials. Give teams time to build models.

**Test**  
1. Gather teams for testing. Tell students that each team will demonstrate their model at the front of the classroom. Explain that teams will offer feedback after each test.  
2. Refer students to *Food Enrichment Toy Test Results* from page 18 of the *Student Guided Practice Book*. Allow time for each team to test their model. A successful model stimulates and challenges the animal and is appropriate for the selected primate based on their behavior, diet, and overall needs.

**Think about It**  
Directions: Respond to the questions to reflect on the process you used to complete the STEAM challenge.

- Which feature of your team's design makes it most successful?
- Which feature of your team's design makes it unique?
- Which feature of your team's food enrichment toy makes it stimulating for the animal?
- During this challenge, what did you contribute?
- What was a surprise or issue your team encountered during this challenge?
- How did your team solve the issue?
- How would you modify your design to make it suitable for another type of primate? Identify the new type of primate, and explain how you would adapt your model.

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19  
Day 3

Activity sheets lead students through the Engineering Design Process.

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



# How to Use This Resource *(cont.)*

## Classroom Library

There are many benefits to wide reading, including an increase in vocabulary development. Reading widely increases listening comprehension and contributes to increased reading comprehension. It can be done through independent reading or through teacher read-alouds. Richard Anderson, Paul Wilson, and Linda Fielding's (1988) research shows that the amount of words read per year greatly increased based on the minutes of independent reading completed per day.

Anderson, Wilson, and Fielding ranked students by the number of minutes they read per day. For example, a student in the 70th percentile read almost 10 minutes per day. These students encountered a little more than 600,000 words per year, while a student in the 90th percentile, who read approximately 21 minutes per day, encountered over 1.8 million words each year. Students who encounter more new words apply the strategies they have been taught, and they start to learn the meanings of new words. All these factors associated with reading widely lead to increased comprehension.

*Summer Scholars* includes a classroom library of 10 books in each level. While these books can help students read widely, they also cover a variety of math and science topics. This can spark student interest and lead to additional connections in grade-level math concepts.

These books can be used as read-alouds, independent reading, or in small groups. They are a flexible tool that can help teachers tailor *Summer Scholars* to meet their unique needs. These books are also available digitally. See page 53 for more information.



# How to Use This Resource *(cont.)*

## Assessment

Assessment is a critical piece of any intervention or summer school program. *Summer Scholars* includes several opportunities for assessment.

- Each kit includes a preassessment and a postassessment to measure student growth. These assessments are provided in the *Student Guided Practice Book*. They can also be accessed as both Google Forms™ and Microsoft Forms® documents. See below for more information. The pages can be ripped out of the student books to make implementation easier.
- Alignments of the preassessments and postassessments are provided digitally. They show the lesson and standard that each question assesses. This can be used to guide further instruction.
- The activity sheets from the *Student Guided Practice Book* can be used as formative assessments.
- Quick Check activities provide the teacher with valuable insight, which enables them to better support students.
- The digital games can also be used to monitor student progress and math fluency.

## Digital Assessment in Summer Scholars

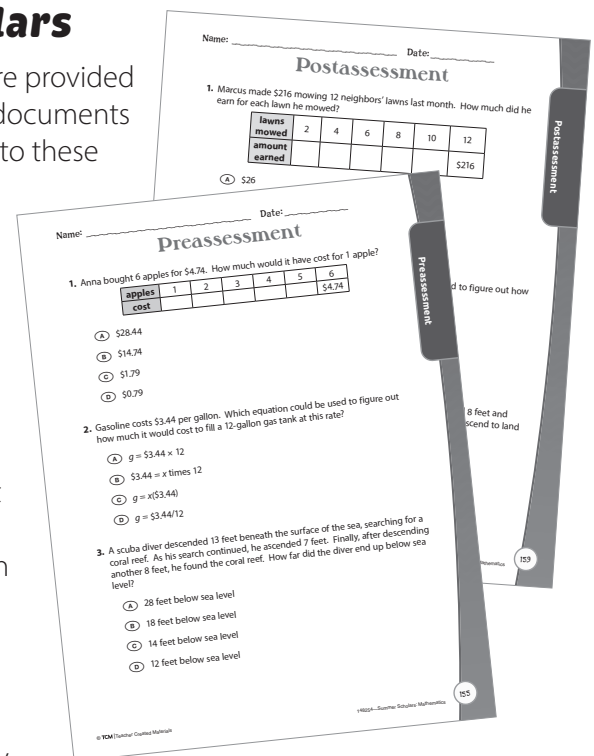
Digital versions of the preassessments and postassessments are provided as fillable PDFs. They can also be accessed as Google Forms™ documents and Microsoft Forms® documents. Please see page 52 for links to these resources.


### Using Google Forms™

The Google Forms™ version of each assessment is best for use with Google Classroom. The links on page 52 prompt a copy of the assessment to be saved to your Google Drive™. From there, a share link can be copied and shared with students to take the assessment from any device that has a web browser and internet connection. Having the assessment in Google Drive™ allows you to easily collect and analyze student data and results. These results can then be shared with administrators as needed.

### Using Microsoft Forms®

The Microsoft Forms® version of the assessment is best for use with Office 365 Education. The links on page 52 prompt a copy of the assessment to be saved to your OneDrive account. From there, a share link can be copied and shared with students to take the assessment from any device that has a web browser and internet connection. Having the assessment in OneDrive allows you to collect and analyze student data and results. These results can then be shared with administrators as needed.





**SUMMER**  
**Scholars**

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**Mathematics**

**Rising 8th Grade**

**Grade Level Details**

# Rising 8th 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		
				Challenge Title and STEAM Step	Standard	
Day 1	Mathematics Focus Proportional Relationships	Standards Recognize, represent, and solve proportional, linear relationships in mathematical and real-world problems.	Mathematical Practice and Card Title "Cookies"	Standard Look for and express regularity in repeated reasoning. Understand that generalizing is a process where specific instances are applied to more than one case.	Amazing Tales of Plant Survival Define the Problem and Make a Plan	Make sense of problems and plan, solve, justify, and evaluate solutions.
					Amazing Tales of Plant Survival Learn Content, Design, and Build	
Day 3	Representing Proportional Relationships with Equations	Recognize proportional relationships between quantities and represent them as equations when given written descriptions, tables, or graphs.	"Cupcake Equations"	Reason abstractly and quantitatively to solve a problem. Understand that quantities are numbers with labels of corresponding units.	Amazing Tales of Plant Survival Test	Use appropriate tools, including real objects and techniques, to solve problems.
					Amazing Tales of Plant Survival Improve	
Day 5	Solving Problems with Rational Numbers	Solve real-world and mathematical problems involving the four operations with rational numbers. Add, subtract, multiply, and divide rational numbers with procedural fluency. Add, subtract, multiply, and divide rational numbers fluently.	"Fasten Your Seatbelts!"	Look for and make use of structure while solving math problems. Understand that analyzing structure means to look at how the mathematics in the task is organized to solve.	Amazing Tales of Plant Survival Reflect and Share	Apply mathematics to solve problems arising in everyday life, society, and the workplace.
					Plant Reproduction Learn Content, Understand the Challenge, and Brainstorm	
Day 6						

# Rising 8th 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 7 Solving More Problems with Rational Numbers	Solve mathematical and real-world problems using the Order of Operations to add and subtract rational numbers with procedural fluency.	"Vacation"	Reason abstractly and quantitatively to solve a problem. Understand that quantities are numbers with labels of corresponding units.	<i>Plant Reproduction</i> Design and Build	Use appropriate tools, including real objects and techniques, to solve problems.
Day 8				<i>Plant Reproduction</i> Test and Reflect	
Day 9 Adding, Subtracting, Factoring, and Expanding Linear Equations	Solve mathematical and real-world problems using the order of operations to multiply and divide rational numbers with procedural fluency.	"Backyard"	Look for and make use of structure while solving math problems. Understand that analyzing structure means to look at how the mathematics in the task is organized to solve.	<i>Plant Reproduction</i> Redesign and Rebuild	Apply mathematics to solve problems arising in everyday life, society, and the workplace.
Day 10				<i>Plant Reproduction</i> Retest and Share	
Day 11 Solve Word Problems with Rational Numbers	Apply and extend previous understanding of properties of operations to add and subtract linear expressions and expand linear expressions with rational coefficients.	"Ocean Creatures"	Use appropriate tools strategically to solve problems. Understand that tools can be physical, such as a ruler, or mental, such as strategic thinking.	<i>All About the Periodic Table</i> Define the Problem and Make a Plan	Make sense of problems and plan, solve, justify, and evaluate solutions.
Day 12				<i>All About the Periodic Table</i> Learn Content, Design, and Build	

# Rising 8th 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 13	Equations Containing One Variable	"Video Game Rentals"	Look for and express regularity in repeated reasoning. Understand that generalizing is a process where specific instances are applied to more than one case.	<i>All About the Periodic Table</i> Test	Use appropriate tools, including real objects and techniques, to solve problems.
Day 14				<i>All About the Periodic Table</i> Improve	
Day 15	Write one-variable, two-step inequalities within a mathematical context to solve problems by reasoning about the quantities.		Look for and make use of structure while solving math problems. Understand that analyzing structure means to look at how the mathematics in the task is organized to solve.	<i>All About the Periodic Table</i> Reflect and Share	Apply mathematics to solve problems arising in everyday life, society, and the workplace.
Day 16	Write Inequalities to Represent Word Problems	"Paddleboards"		<i>Air and Weather</i> Learn Content, Understand the Challenge, and Brainstorm	Define a simple design problem reflecting the need or want that includes specified criteria for success.
Day 17	Know and apply the formulas for determining the area and circumference of a circle, and exploring the relationship between the circumference and diameter, to solve mathematical and real-world problems.		Look for and express regularity in repeated reasoning. Understand that generalizing is a process where specific instances are applied to more than one case.	<i>Air and Weather</i> Design and Build	Use appropriate tools, including real objects and techniques, to solve problems.
Day 18	Area and Circumference of Circles	"Circles in Sports"		<i>Air and Weather</i> Test and Reflect	

# Rising 8th 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 19	Solving for Unknown Dimensions	"3D Printing"	Use appropriate tools strategically to solve problems. Understand that tools can be physical, such as a ruler, or mental, such as strategic thinking.	<i>Air and Weather</i> Redesign and Rebuild	Apply mathematics to solve problems arising in everyday life, society, and the workplace.
Day 20				<i>Air and Weather</i> Retest and Share	
Day 21	Understanding Random Samples	"Valid or Not Valid"	Construct viable arguments and critique the reasoning of others. Understand how to use evidence to justify thinking and respectfully critique the reasoning of others.	<i>Space Technology</i> Define the Problem and Make a Plan	Make sense of problems and plan, solve, justify, and evaluate solutions.
Day 22				<i>Space Technology</i> Learn Content, Design, and Build	
Day 23	Understanding Probability	"Games"	Look for and make use of structure while solving math problems. Understand that analyzing structure means to look at how the mathematics in the task is organized to solve.	<i>Space Technology</i> Test	Use appropriate tools, including real objects and techniques, to solve problems.
Day 24				<i>Space Technology</i> Improve	
Day 25	Culminating Activity			<i>Space Technology</i> Reflect and Share	Apply mathematics to solve problems arising in everyday life, society, and the workplace.

# Rising 8th Grade STEAM Challenges and Materials

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

Challenge Name	Description	Materials
<i>Amazing Tales of Plant Survival</i>	Teams will create models of a newly discovered plant affected by its extreme environment.	<ul style="list-style-type: none"> <li>• 2 paper plates</li> <li>• modeling clay</li> <li>• construction paper</li> <li>• 5 cardboard tubes</li> <li>• 10 pipe cleaners</li> <li>• 10 craft sticks</li> <li>• masking tape</li> <li>• 10 toothpicks</li> </ul>
<i>Plant Reproduction</i>	Groups will collaborate to make vehicles for seed dispersal.	<ul style="list-style-type: none"> <li>• 5 cardboard pieces</li> <li>• 4 coffee filters</li> <li>• handheld fan</li> <li>• foil</li> <li>• lima beans</li> <li>• 15 pipe cleaners</li> <li>• 4 ft. of string</li> </ul>
<i>All About the Periodic Table</i>	Teams will design and create mobiles inspired by the periodic table. The mobiles need to be hangable.	<ul style="list-style-type: none"> <li>• 30–50 beads</li> <li>• 10 craft sticks</li> <li>• masking tape</li> <li>• 10 index cards</li> <li>• 10 paper clips</li> <li>• 3 paper plates</li> <li>• 10 pipe cleaners</li> <li>• pom-pom balls</li> <li>• 5 ft. of string</li> <li>• 4 wooden dowels</li> </ul>
<i>Air and Weather</i>	Groups will build parachutes that can unfold or already be in its open position when dropped.	<ul style="list-style-type: none"> <li>• 5 cardboard tubes</li> <li>• 4 ft. of string</li> <li>• plastic wrap</li> <li>• 5 pieces of tissue paper</li> <li>• paper clips</li> <li>• 2 washers</li> <li>• 2 identical items to drop</li> </ul>
<i>Space Technology</i>	Teams will engineer models of a Mars lander that can safely land a marshmallow when dropped to the ground.	<ul style="list-style-type: none"> <li>• 5 coffee filters</li> <li>• 20 craft sticks</li> <li>• 10 sheets of tissue paper</li> <li>• large paper or plastic cup</li> <li>• foil</li> <li>• masking tape</li> <li>• 6 index cards</li> <li>• 5 ft. of string</li> </ul>



# Rising 8th 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>All About Mechanical Engineering</i>	770L	Y	Learn about how mechanical engineering is used all around us. Readers will discover things such as velocity, acceleration, rotation, dimensions, measurements used, and Newton's Laws.
<i>Hurricane Hunters: Measures of Central Tendency</i>	920L	V	Learn about measures of central tendency while following the lives and work of hurricane hunters! Read about the instruments that hurricane hunters use and how they analyze the data that these instruments collect.
<i>Investigating Forces and Motion</i>	810L	W	Force and motion are all around us and help us move and do great things! Readers will explore how forces and motions work.
<i>Isaac Newton and the Laws of the Universe</i>	800L	X	Read about the incredible life of Isaac Newton in this fascinating biography. Learn how Newton researched gravity, acceleration, deceleration, motion, and light spectrum.
<i>Land Animals: Solving Equations and Inequalities</i>	970L	V	Practice solving equations and inequalities while reading about land animals from all over the world! Learn interesting facts about Earth's land animals, discovering how zoologists use variables to solve equations and inequalities, and answer questions about these animals.
<i>Package Design: Surface Area and Volume</i>	920L	W	Learn how designers work with two-dimensional and three-dimensional shapes, measuring their surface area, volume, diameter, and radius, to create great package designs!
<i>Tonight's Concert: Using Data and Graphs</i>	940L	W	Learn how to read and construct statistical graphs and prepare for a concert! Master bar graphs, circle graphs, line graphs, histograms, and line plots.
<i>What Did I Eat?: Fractions, Decimals, and Percents</i>	870L	V	Learn about the ingredients and nutrients of various foods while practicing mathematical operations with fractions, decimals, and percentages!
<i>Where Germs Lurk: Simplifying and Evaluating Expressions</i>	860L	W	Write, simplify, and evaluate algebraic expressions to explore how quickly germs can spread! Learn all about germs and how they spread, encouraging healthy habits, while allowing students to practice algebraic expression, exponential form, and distributive property.
<i>The Wonder of Outer Space</i>	780L	S	Come explore the wonders of space! From satellites to space food, observatories to Sputnik, readers will learn all about space and the various ways people have explored and learned about astronomy for years!

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



# SUMMER Scholars

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## Mathematics

## Teacher's Guide

## Rising 8th Grade

# Days 1–2 Overview

## Proportional Relationships

### Learning Outcome

- Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin.

### Focus

This lesson will address this focus question: *How do you know if two quantities are in a proportional relationship when given a table or graph?* You may wish to write the focus question on the board or chart paper and read it aloud to students.

### Teacher Background

Proportional thinking prepares students for higher-level mathematics. The progression from linear equations and graphs to quadratic equations and graphs starts with proportional thinking. Students may have difficulty setting up ratios and finding equivalent ratios. Creating a table and/or graphing the ordered pairs can help students determine if there is a proportional relationship. Students may also draw models of each ratio to explain their reasoning.

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## Mathematical Discourse

### Learning Outcome

- Look for and express regularity in repeated reasoning. Understand that generalizing is a process where specific instances are applied to more than one case.

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## Amazing Tales of Plant Survival

### Learning Outcome

- Use mathematical knowledge to define an engineering problem and design solutions.

### STEAM Vocabulary

adaptations

native

carnivorous

photosynthesis

cloning

pollen

### Materials

- *Student Guided Practice Book* (pages 4–14)
- *Cookies* task card
- *Amazing Tales of Plant Survival* book
- chart paper
- markers

\*You may wish to assemble one set of STEAM materials for students to reference (see page 10).

# Proportional Relationships

## Warm-Up

- Write the following problem and table on the board or chart paper: *Janie is bringing cupcakes to a bake sale. She charges \$1.50 for two cupcakes. What is the unit price of the cupcakes? How much will 15 cupcakes cost?*

<b>cupcakes</b>	2	4	6	12	15
<b>price</b>	\$1.50	\$3.00	\$4.50	\$9.00	?

- Ask, "How can we find the unit price of the cupcakes?" (*Write a complex fraction for price/cupcakes.*) Remind students to find the unit price by dividing the numerator by the denominator. Ask, "How do you divide fractions?" (*Multiply the first fraction by the reciprocal of the second fraction.*) Have students work with partners to solve the problem. Students should find that the unit price for one cupcake is \$0.75 by dividing \$1.50 by 2.
- Ask students, "How do you find the cost of 15 cupcakes?" (*Multiply 15 by the unit price, \$0.75, which is \$11.25.*)

## Language and Vocabulary

- Prior to the lesson, write the following vocabulary terms on the board or chart paper:
  - equivalent ratio
  - ordered pairs
  - origin
  - proportional relationship
- Have students create working definitions of the terms based on their previous experience with them. Provide students with markers and chart paper. During the lesson, have students revise and/or add to their definitions.
- Review the definitions with students. A proportional relationship exists if the ordered pairs  $(x, y)$  in a table are equivalent ratios and the graph will pass through the origin and make a straight line on a coordinate plane.

# Proportional Relationships

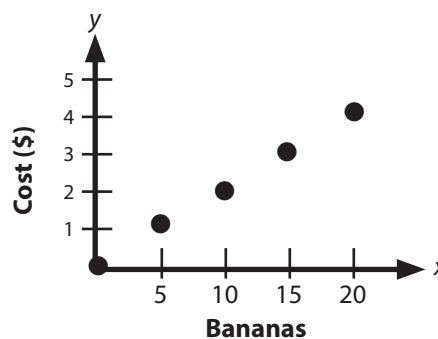
## I Do 15 min

1. Say, "Today, we are going to look at tables and graphs to determine if there is a proportional relationship."
2. Say, "We will start by looking at a table." Write the following table on the board or chart paper.

<b>bananas (x)</b>	5	10	15	20
<b>cost (y)</b>	\$1.00	\$2.00	\$3.00	\$4.00

3. Say, "To determine if there is a proportional relationship, we have to see if the ordered pairs in the table are equivalent ratios." Ask, "What patterns do you see in this table?" Allow students to discuss their ideas with partners and share. Students may indicate that for every group of 5 bananas, the cost increases by \$1.00.
4. Ask, "How do we find the unit rate?" (*Divide the cost by the number of bananas.*) Say, "Let's divide \$1.00 by 5 to see what the cost of one banana is. When thinking of money, if I share \$1.00 into 5 groups, how many cents will be in 1 group?" (*\$0.20*) Ask, "So, what is the unit rate?" (*The cost per one banana is \$0.20.*) Have students check that the unit rate is true for all the ordered pairs by multiplying the unit cost by the number of bananas to find the total cost. Say, "Since all of the ratios are equal, the table shows a proportional relationship."

5. Say, "Let's graph the ordered pairs from the table. When graphing, remember to start at the origin (0, 0). For the x-coordinate, move left or right along the x-axis, and for the y-coordinate, move up or down along the y-axis." Display the following graph.



6. Say, "Notice that the points (when connected) form a straight line that passes through the origin (0, 0). This graph is an example of a proportional relationship."

**Support for Language Learners:** Each time you use the terminology *proportional relationship*, *equivalent ratio*, *ordered pairs*, and *origin*, point to them in the problem. This will allow students to associate the verbal word with the visual representation. For example, as you discuss the origin, point to (0, 0) on the coordinate plane to emphasize the word and the example.

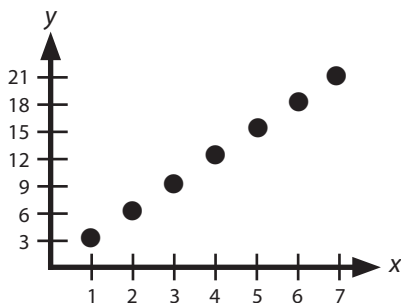
# Proportional Relationships

## We Do

1. Display *Painting Ratios* on page 4 of the *Student Guided Practice Book*. Say, "Let's look at another table together." Display the table for Question 1:

yellow	4	6	8	10
blue	8	12	16	

2. Ask, "How can we determine if the ratios in the table are equivalent?" (*Look for a pattern within the numbers.*) Ask, "Are these equivalent ratios?" (*Yes.*) "How do you know?" (*The number of ounces of blue paint is double the amount of ounces of yellow paint.*) Ask, "Does this table show a proportional relationship?" (*Yes, because the ratios are equivalent.*) Ask, "How do we find the number of ounces of blue paint needed for 10 ounces of yellow paint?" (*Multiply 10 and 2, which is 20.*)
3. Say, "Now, let's determine if there is a proportional relationship by looking at a graph." Display the table for Question 2:



4. Ask, "How can we determine if this graph shows a proportional relationship?" Allow students to discuss with partners, and then ask for volunteers to share with the class. Students should agree that the graph of a proportional relationship must start at the origin  $(0, 0)$  and that the points must form a straight line. Ask, "Does this graph show a proportional relationship?" (*Yes, the graph satisfies both conditions.*)

5. To help students explain their reasoning, provide them with the following sentence frames.

- *For a table to show a proportional relationship, the \_\_\_\_\_ must be \_\_\_\_\_.* (ratios; proportional)
- *For a graph to show a proportional relationship, it must pass through the \_\_\_\_\_ and the points must form a \_\_\_\_\_.* (origin  $(0, 0)$ ; straight line)

## You Do

1. Have students complete *Baking Proportions* from page 5 of the *Student Guided Practice Book*. Encourage students to remember that a proportional relationship can be determined by proportional ratios and graphed so that ordered pairs pass through the origin and are in a straight line.
2. Have students share their solutions and reasonings. If students have difficulty explaining their reasonings, remind them to use the sentence frames and vocabulary terms.

# Cookies

**Cookies**

Liem goes to a bakery to buy cookies for a party. Determine whether the relationship between the cookies and cost is proportional or nonproportional. Explain how you know.

Cookies	Cost
1	\$1.50
6	\$9.00
12	\$14.00
24	\$26.00

If Liem purchases 12 cookies, how much is he paying for each cookie?

**Challenge Problems**

A cookie recipe requires  $\frac{3}{4}$  cups of flour to make 5 dozen cookies. How much flour is needed to make 4 dozen cookies?

If a 10-pound turkey takes 4 hours to cook in the oven, how long would it take to cook a 16-pound turkey?

## Math Skill—Proportional Relationships

Students will build on their prior knowledge of unit rates, ratios, and analyzing graphs to understand what proportional relationships are and how they function. They will use their understanding of proportional relationships to solve problems in a variety of ways.

### Support for Language Learners:

Mathematical terms, such as *ratio* and *rate*, can be challenging to learn. They sound similar but have different meanings. Support students by creating a visual chart that includes vocabulary words, definitions, and examples of these terms for students to reference.

## Procedure

1. Make the math real for students. Remind them that proportional relationships can be determined if you have graphs or tables of values. For a graph, a proportional relationship is observed with a straight line through the origin (0, 0). For a table, a proportional relationship is indicated when each value of the ratio is divisible by the same number.
2. Display the *Cookies* task card, and read aloud the text. Give students the opportunity to ask clarifying questions before starting the task.
3. Provide time for students to collaborate with partners to complete the task from page 6 of the *Student Guided Practice Book*. (Students will complete the challenge problems on the next day of instruction.)
4. Have partners discuss the Discourse Prompts.

### Discourse Prompts

- How is the *Cookies* task related to unit rate?
- How would you teach a classmate who missed today's lesson to determine if two variables are proportional?

## Lesson Support

**Answer:** The number of cookies is not proportional to the cost. **Note:** Some students may notice that the cost of 6 cookies is proportional to the unit rate. You would pay \$1.17 per cookie if you purchased 12 cookies.

**Possible Student Misconception:** Look for students who have difficulty comparing values to determine if they are proportional. Remind them to be consistent when writing proportions (e.g., cookies:cost or cost:cookies).

# Amazing Tales of Plant Survival

## Materials and Preparation

- Prepare a set or list of supplies to show students (5 cardboard tubes, construction paper, 10 craft sticks, masking tape, modeling clay, 2 paper plates, 10 pipe cleaners, 10 toothpicks).

## Read Aloud

1. Draw a two-column chart on the board or on chart paper with one column titled *What Plants Provide* and the other column titled *What Plants Require*. Invite students to share their ideas aloud to complete the chart. To activate their thinking about plants surviving in harsh environments, ask students to suggest how plants may respond if an aspect of what plants require was limited or unavailable. Ask students which of Earth's environments may be considered harsh for plant survival and why.
2. Read aloud a few pages of the *Amazing Tales of Plant Survival* book to students. While reading, have them continue to document new information about plants on the two-column chart.

## Define the Problem

1. Have students work in pairs to create sketches of plants living in their native environments. Ask students to include as many features of the plants as they can think of based on their prior knowledge and new information from the text. Encourage students to add details to their plant sketches, including shapes of leaves, root structures, and plant height.
2. Reveal the STEAM challenge by reading aloud pages 28–29 of the book. Students can follow along on page 7 of the *Student Guided Practice Book*.

3. Refer students to *Make a Plan* on page 8 of the *Student Guided Practice Book*. Have students write quick summaries of the challenge with partners. Summaries should include constraints and criteria.

4. Have students complete the My Design portion of the page independently. Students will complete the Team's Design section on the next day of instruction.

## Vocabulary Activity

1. Write the vocabulary words (*adaptations*, *carnivorous*, *cloning*, *native*, *photosynthesis*, *pollen*) on the board or chart paper. Ask students to suggest definitions for any words they are familiar with, including parts of a word such as *adapt* in the word *adaptations*. Have students provide a context of where they have used each word.
2. Discuss with students the meaning of each vocabulary word, and record definitions. Have students work in pairs to use each of the words correctly in a sentence. Invite students to share their sentences aloud.



# Proportional Relationships

## Progress Monitoring

1. Have students complete *Quick Check* on page 9 of the *Student Guided Practice Book* to gauge student 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.

## Rotations

Place students in two groups. Work with one group on the Refocus activity while the other group completes 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. Write the following table on the board or chart paper:

<b>chores</b>	1	2	3	4	5
<b>earnings</b>					

Say, "Pretend your parent is going to pay you \$1.00 for each chore you do. Let's complete the table to find your earnings." Guide students in completing the table. Ask, "What is the unit rate?" (*\$1.00 per chore*) "How much will you earn if you do two chores?" (*\$2.00*) "What is the repeating pattern?" (*Multiply the number of chores by \$1.00.*)

2. Once you have completed the table, have students complete tables independently if the unit rate is \$5.00 per chore.
3. If time allows, support students as they complete Question 1 from *Refocus* on page 10 of the *Student Guided Practice Book*. If not, students will complete both problems from this page during the Practice activity.

### Extend

1. Support students as they complete *Extend Learning Task* on page 11 of the *Student Guided Practice Book*.
2. Students will create their own tables and graphs that represent a proportional relationship. Ask students to choose topics for the x- and y-coordinates and create a repeating pattern to complete the table. Then, they will graph their ordered pairs on the coordinate plane. Finally, have them exchange their work with partners who will determine if their table and graph represent a proportional relationship.

### Practice

- **Refocus Group Practice:** Have students complete the questions on *Refocus* on page 10 of the *Student Guided Practice Book* to reinforce their learning.
- **Extension Group Practice:** Have students complete *Independent Practice* on page 12 of the *Student Guided Practice Book* to reinforce their learning.

# Proportional Relationships

## Math in the Real World

1. Display *Math in the Real World: Planting Time* from page 13 in *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 complete 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 indicate that they know some of the ordered pairs in the table and can use that information to find the pattern and complete the table so that it represents a proportional relationship. They need to complete the table, find the unit ratio, and decide if the owner is right or wrong. 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.
  - What are you trying to find out?
  - How do you know if the table represents a proportional relationship?
  - What is the unit ratio for this table?
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 reasonings. Students should find that the unit ratio is 3 bean plants for every 1 sunflower. Students should complete the table by multiplying the number of sunflowers by 3 to find the number of bean plants. They should understand that the table represents a proportional relationship. The owner of the nursery is incorrect. The ratio of sunflowers to bean plants in the table is 1:3, not 3:1.
5. As groups share their solution paths, reasonings, and strategies, ask the following questions.
  - Do you agree or disagree with the solution path and reasoning? Why?
  - Who can restate \_\_\_\_\_'s strategy/solution path/reasoning?
  - Which solution path makes the most sense to you? Why?

**Support for Language Learners:** Share these sentence frames to help students explain their reasonings.

- *I completed the \_\_\_\_\_ by \_\_\_\_\_.*
- *The table represents a \_\_\_\_\_ because \_\_\_\_\_.*
- *The unit ratio is \_\_\_\_\_ because \_\_\_\_\_.*

# Cookies

## Challenge Problems

1. Provide time for students to complete the *Cookies* task from the previous day of instruction.
2. Have pairs of students work together to complete the challenge problems.

A cookie recipe requires  $3\frac{1}{2}$  cups of flour to make 5 dozen cookies. How much flour is needed to make 4 dozen cookies?

**Answer:**  $2\frac{4}{5}$  cups of flour

If a 10-pound turkey takes 4 hours to cook in the oven, how long would it take to cook a 16-pound turkey?

**Answer:**  $6\frac{2}{5}$  hours

# Amazing Tales of Plant Survival

## STEAM Challenge

## Materials and Preparation

- Prepare a set or list of supplies to show students (5 cardboard tubes, construction paper, 10 craft sticks, masking tape, modeling clay, 2 paper plates, 10 pipe cleaners, 10 toothpicks).

## Read Aloud

1. Ask a volunteer to share a quick, one-sentence summary of what was read yesterday in the *Amazing Tales of Plant Survival* book.
2. Continue reading aloud from the book for about five minutes. Pause periodically to discuss new information and answer any questions students may have.

## Science Connection

1. Ask students to envision themselves as botanists who have been asked to deliver a presentation about a plant adaptation at a scientific conference.
2. Have students work in pairs to prepare information needed for the presentation on *You're the Expert* from page 14 of the *Student Guided Practice Book*.

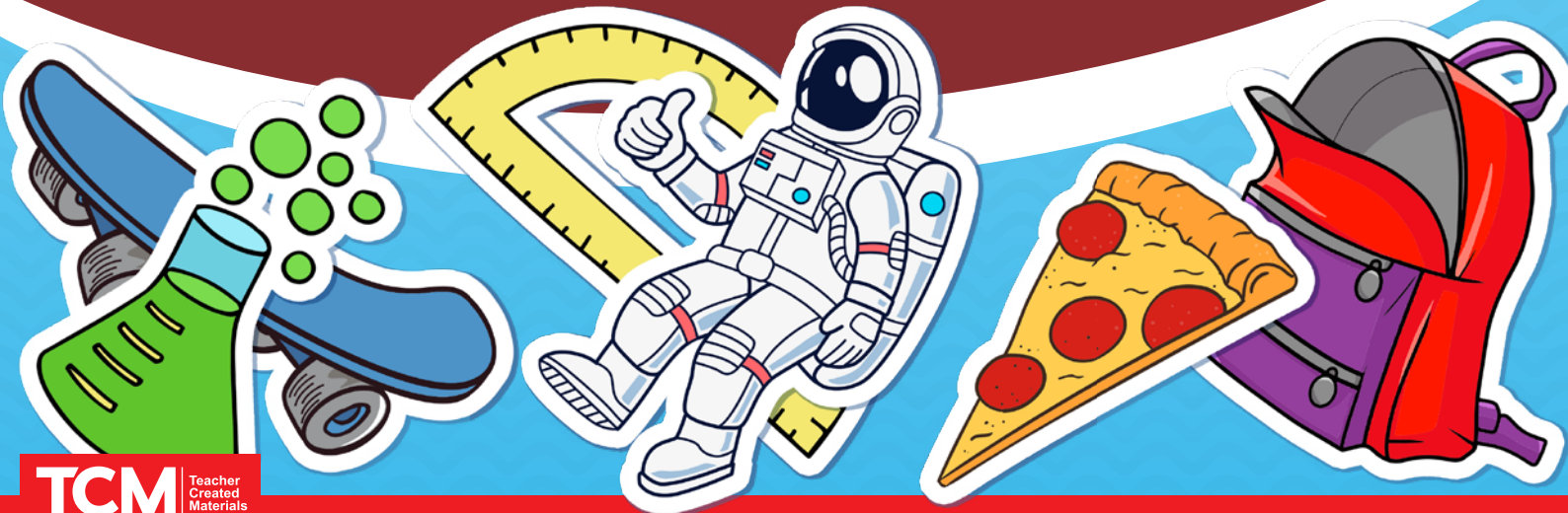
## Design

1. Organize students into teams, and ask teams to have members share the designs they created on the previous day of instruction using *Make a Plan* from page 8 of the *Student Guided Practice Book*.
2. Have groups choose, sketch, and label team designs on the Team's Design section on *Make a Plan*. Each team should incorporate ideas from individual students' designs. (Team designs must be submitted for teacher approval before building begins.)
3. Tell students they will build models of their team designs on the next day of instruction.

SUMMER  
**Scholars**  
Mathematics

# Student Guided Practice Book

Rising 8th Grade



# Painting Ratios

**Directions:** Solve the problems.

- 1 An art teacher has a table of yellow paint and blue paint to mix to get a certain hue of green. Does the table show a proportional relationship between yellow and blue? Explain your solution. If so, complete the table.

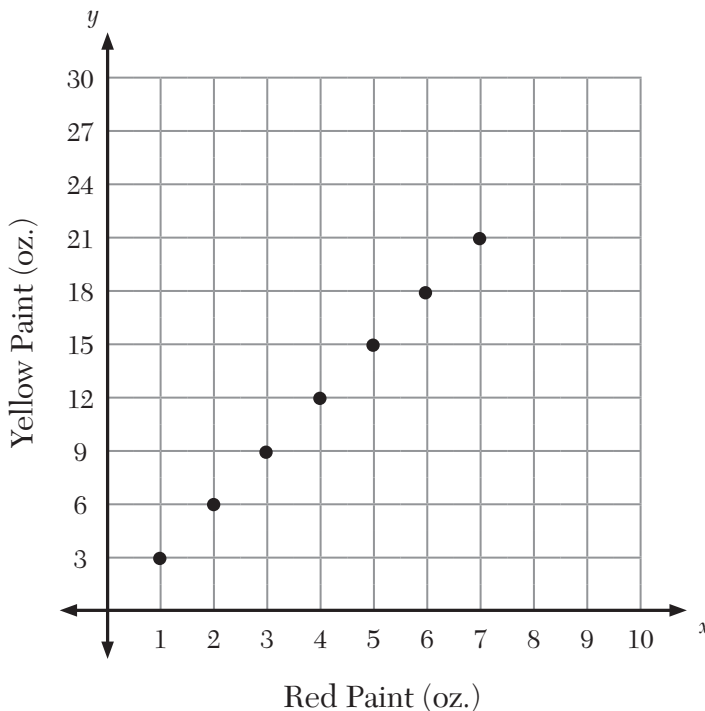
<b>Yellow</b>	4	6	8	10
<b>Blue</b>	8	12	16	

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- 2 Jean draws a graph that shows the amount of red and yellow paint to mix to get a certain hue of orange. Does her graph show a proportional relationship? Explain your solution.




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# Baking Proportions

**Directions:** Solve the problems.

- 1 Cara shows the number of cookies and cupcakes she sells at the bake sale each hour in the table below. She says that she always sells the cupcakes and cookies in the same proportion. Is Cara correct? Explain your solution.

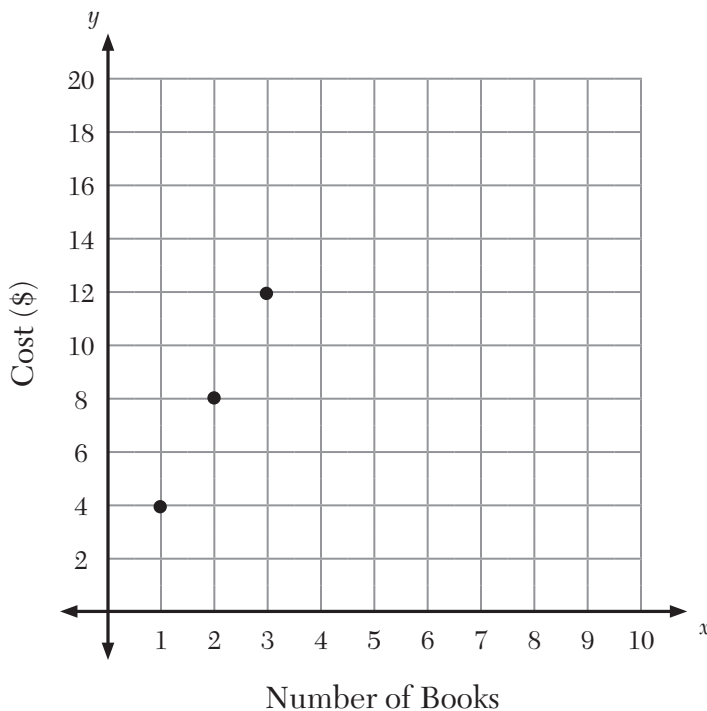
<b>Cupcakes</b>	3	6	9	12
<b>Cookies</b>	6	12	18	21

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- 2 The graph below shows the cost of a given number of books. Does the graph show a proportional relationship? Explain your solution.




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# Cookies

Liem goes to a bakery to buy cookies for a party. Determine whether the relationship between the cookies and cost is proportional or nonproportional. Explain how you know.

Cookies	Cost
1	\$1.50
6	\$9.00
12	\$14.00
24	\$26.00

If Liem purchases 12 cookies, how much is he paying for each cookie?



## Challenge Problems

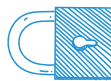
A cookie recipe requires  $3\frac{1}{2}$  cups of flour to make 5 dozen cookies. How much flour is needed to make 4 dozen cookies?

If a 10-pound turkey takes 4 hours to cook in the oven, how long would it take to cook a 16-pound turkey?

# STEAM CHALLENGE

## Define the Problem

As a botanist, you are constantly exploring extreme environments looking for new plant species. You recently discovered an amazing new plant but were unable to remove any samples from the environment. Your camera was also affected by the extreme conditions, so no photographs of the plant exist. However, you need to share information about it with other scientists. Your task is to create a model of your newly discovered plant species to share with others.



**Constraints:** You may only use the materials provided to you. Your newly discovered plant must live in a real and extreme environment on Earth.



**Criteria:** Your model plant must show the adaptations that allow it to survive in the extreme environment where it lives. The model plant must show how it protects itself from being eaten and how it protects itself from the weather. The model must also show the unique way it reproduces. You may include any other unique adaptations.



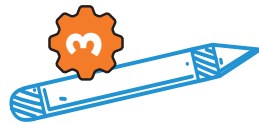
## Research and Brainstorm

What are some extreme environments on Earth, and where did you discover this new plant species? What are some adaptations of other plants that help them in extreme environments? What special structures or behaviors could your plant have to help it survive? Which materials will work best for your model?



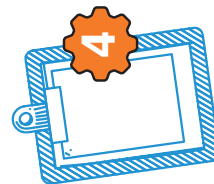
## Design and Build

Sketch two or more designs for your plant model. Label the parts and the materials. Choose the design you think will best meet the criteria. Then, build your plant model.



## Test and Improve

Share your model with others. Explain where it was discovered. Explain its special structures and behaviors that help it survive. How can you improve it? Will you set any new goals for your design? What are they? Modify your design and reassess how well it meets the criteria.



## Reflect and Share

What about this challenge did you find most interesting? How did you apply your scientific knowledge to complete this challenge? How can models be helpful?



Name: \_\_\_\_\_ Date: \_\_\_\_\_

# Make a Plan

**Directions:** Summarize the challenge. Then, sketch your design to solve the challenge.

**Challenge:** \_\_\_\_\_  
\_\_\_\_\_

## My Design

**Directions:** Sketch your team's design. Label the materials needed.

## Team's Design

# Quick Check

**Directions:** Answer the questions.

- 1 Jason is mixing red and blue paint to get different hues of purple. Does his table show a proportional relationship? Choose yes or no. Explain your answer.

<b>Red</b>	1	4	6	9
<b>Blue</b>	4	16	24	36

Yes  
 No

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- 2 Judie posts a table to show how many cups of dried fruit and nuts go into batches of trail mix. Does the table show a proportional relationship? Choose yes or no. Explain your answer.

<b>Dried fruit</b>	2	4	6	8
<b>Nuts</b>	6	12	24	32

Yes  
 No

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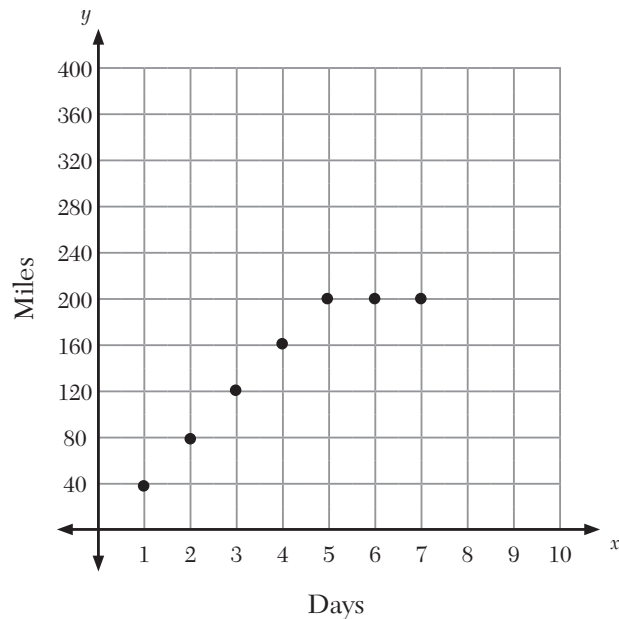


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- 3 Harry draws a graph of how many miles the drivers for his trucking company should be driving over the course of one week. Does the graph show a proportional relationship? Explain your answer.




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Name: \_\_\_\_\_ Date: \_\_\_\_\_

# Refocus

Day 2

**Directions:** Do the tables show proportional relationships? Explain your solutions.

- 1 Jim made a table of the number of days he runs and the miles he runs.

Days	5	7	8	10	12
Miles	30	42	48	60	72

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- 2 The table shows the price of fruit smoothies at a local health club.

Smoothies	3	4	6	8	9
Price	\$9.00	\$12.00	\$24.00	\$32.00	\$81.00

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Name: \_\_\_\_\_ Date: \_\_\_\_\_

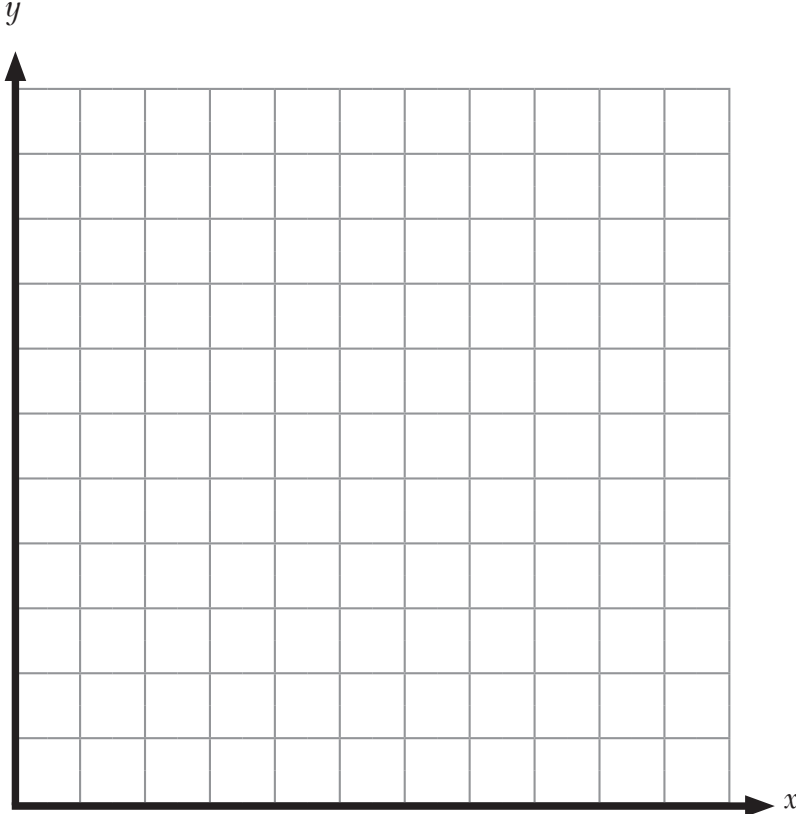
# Extend Learning Task

**Directions:** Create a table and graph that represents a proportional relationship.

Day 2

1


2



Does the table and graph represent a proportional relationship? How do you know?

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Name: \_\_\_\_\_ Date: \_\_\_\_\_

# Independent Practice

Day 2

**Directions:** Does each table show a proportional relationship? Explain your solutions.

1

5	7	8	9	10
20	28	32	36	40

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2

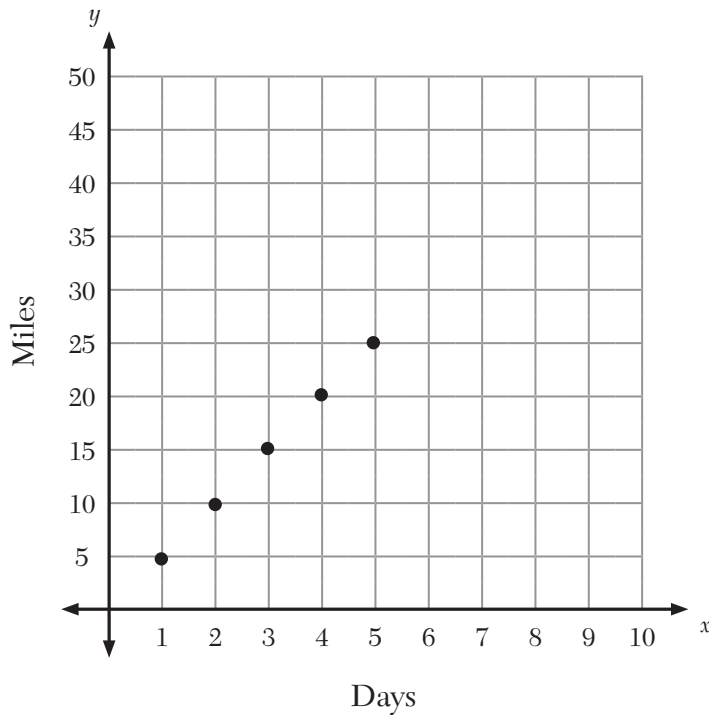
4	5	7	9	10
24	30	42	63	70

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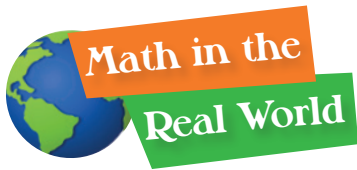
**Directions:** Does the graph show a proportional relationship? Explain your solution.

3



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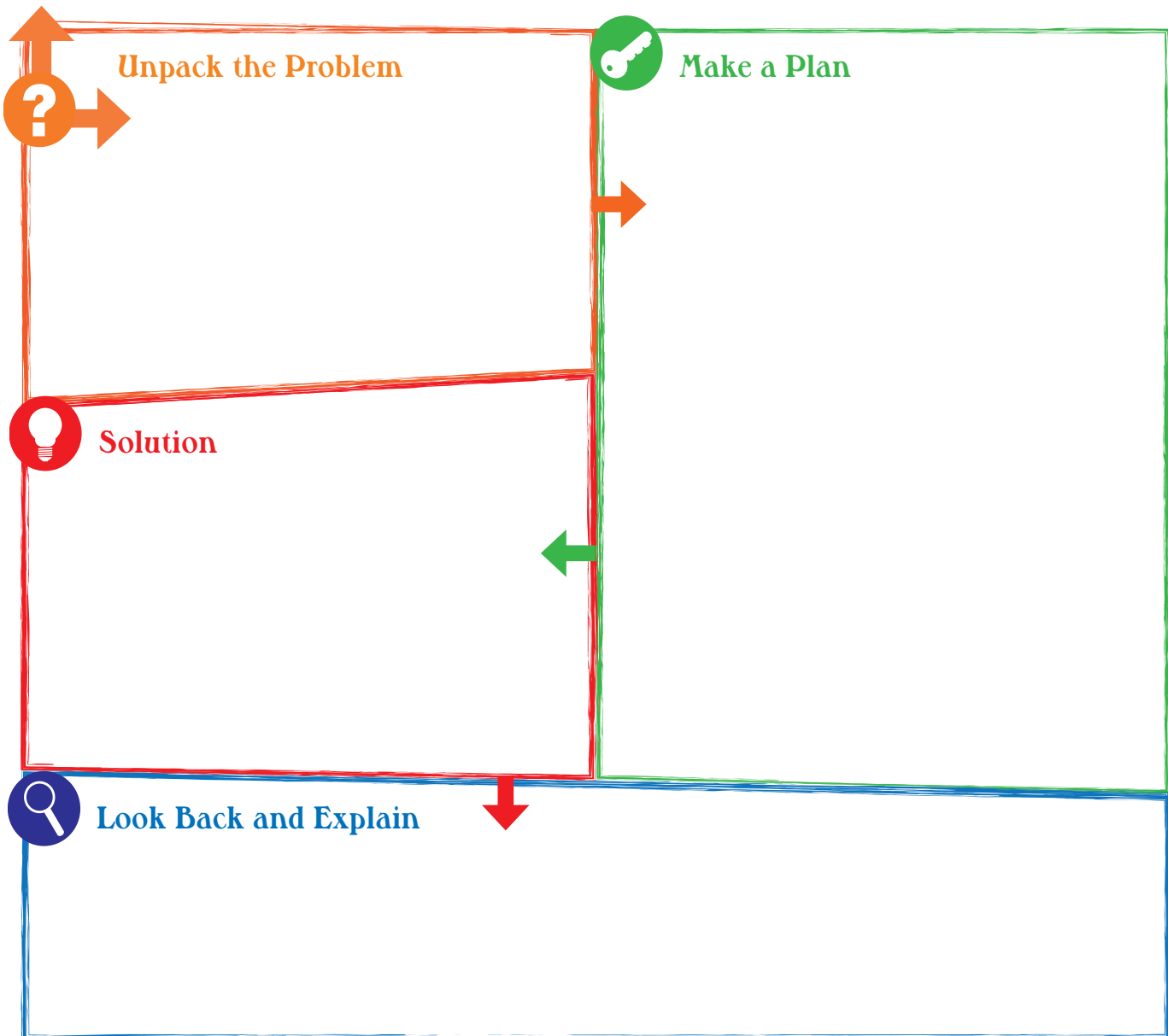


# Planting Time

The table shows a guide for planting flowers and vegetables in a garden nursery. Some of the numbers were washed away during a rainstorm. Complete the table so that it represents a proportional relationship.

<b>Sunflowers</b>	8	18	30		36	42		55
<b>Bean Plants</b>		54		96		126	135	165

- A. What is the unit ratio?
- B. The owner of the nursery says that if there are 180 bean plants planted, there should be 540 sunflowers planted. Is she right or wrong? Explain your solution.



Name: \_\_\_\_\_ Date: \_\_\_\_\_

# You're the Expert

Day 2

**Directions:** Choose a plant from the book to investigate.

Name the plant, and describe or show where it's found.

List features of the environment that make it hard for the plant to survive.

Draw a picture to show the plant's adaptations in this environment. Label the adaptations.

Include a fun fact or interesting feature about this plant.