



ALL ABOUT[®] Math

The program that takes the struggle out of math

Level 5 Teacher's Manual Sample

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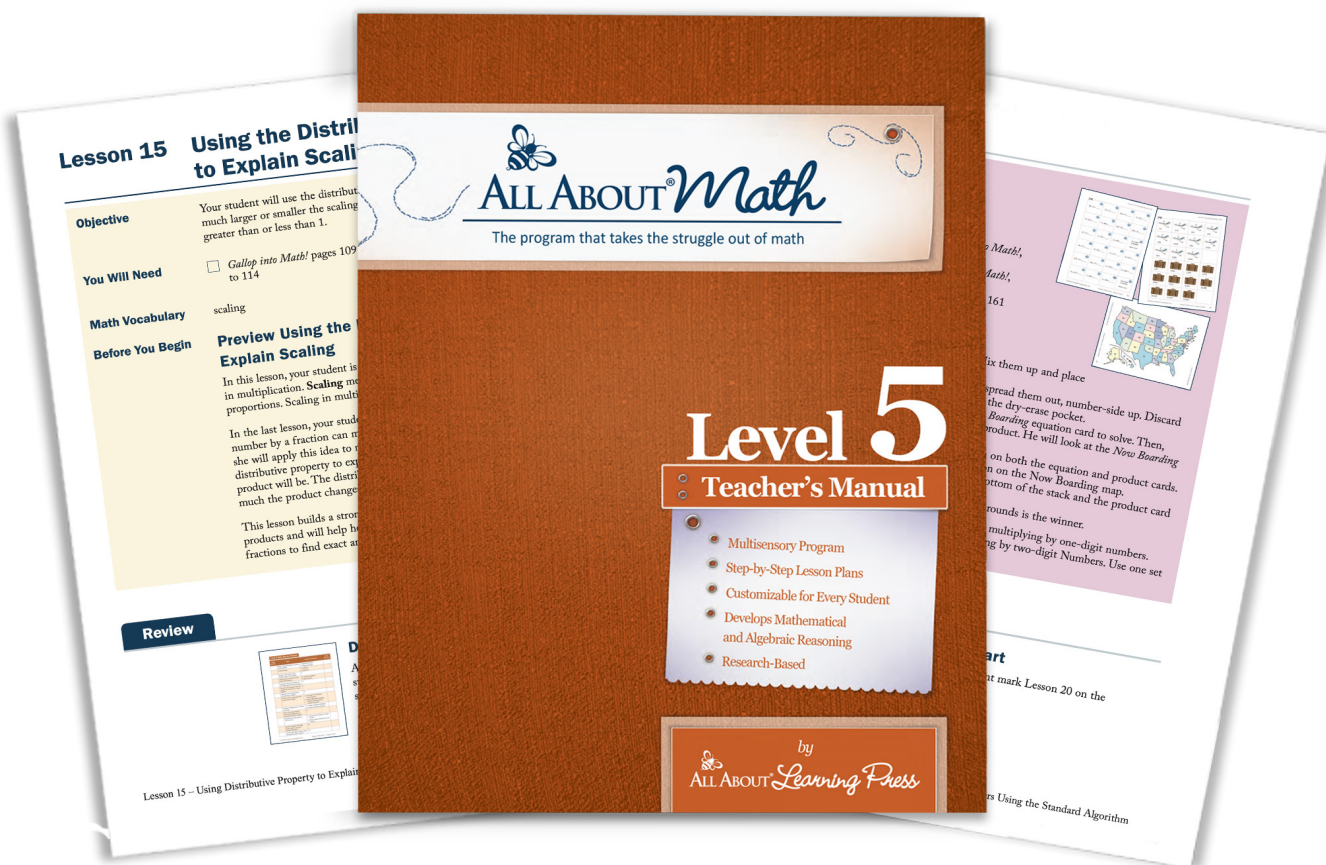


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1

Preparing for Level 5

Start Here!

To prepare for teaching *All About Math* Level 5, you can either watch our short videos or follow the checklist on the subsequent pages. Do whichever works best for you!

Option 1: Watch the Videos



Go to www.aalp.tv/math-level-5 on your phone, tablet, computer, or scan the QR code to be taken directly to the videos.



Let us show you how to get set up for success!



After watching the videos, turn to page 33 of this teacher's manual to start teaching the first lesson.



Option 2: Read the Following Pages



Check off each as you complete it.



Is Your Student in the Right Level?

If your student did not complete *All About Math* Level 4, use this checklist and the *Gallop into Math!* activity book pages 389 to 400 to verify placement in Level 5. Your student should get all items in a question correct in order to checkmark that question.

1. Your student can identify and create models to represent fractions. Have your student partition and shade the model or identify the fraction based on the fraction situation on the student activity page.

Model 1: (*partitioned into twelve equal parts with five parts shaded in*)

Model 2: (*$\frac{7}{10}$ of the quilt is blue*)

2. Your student can compare fraction models. To test this, have your student partition and shade the model to compare the fractions using comparison symbols.

Model 1: ($\frac{5}{6} > \frac{5}{8}$)

Model 2: ($\frac{3}{12} < \frac{3}{10}$)

3. Your student can order sets of fractions with the same denominator or the same numerator from least to greatest or greatest to least. Have your student list the fractions in the correct order on the student activity page.

Comparison 1: ($\frac{1}{5}, \frac{3}{5}, \frac{5}{5}, \frac{8}{5}$)

Comparison 2: ($\frac{3}{5}, \frac{3}{8}, \frac{3}{10}, \frac{3}{12}$)

4. Your student can compare the sizes of fractions by comparing them to the benchmarks of $\frac{1}{2}$ and 1. Have your student place a check mark to answer if the fraction is less than $\frac{1}{2}$, between $\frac{1}{2}$ and one, or greater than one. Then, have your student write how far each fraction is from one whole.

Answer: ($\frac{3}{10}$ is less than $\frac{1}{2}$ and $\frac{7}{10}$ away from one whole. $\frac{7}{12}$ is between $\frac{1}{2}$ and one and $\frac{5}{12}$ from one whole. $\frac{7}{4}$ is greater than one whole and $\frac{3}{4}$ away from one whole.)

5. Your student can use visual representations to show that fractions are equivalent. To test this, have your student shade the model to find the equivalent fraction. Then, have your student write the fraction on the lines.

Answer: (*The model on the left represents $\frac{3}{4}$. The equivalent fraction is $\frac{9}{12}$. Nine of the 12 parts are shaded in.*)

6. Your student can generate equivalent fractions by using multiples of both the numerator and denominator. To test this, have your student write two fractions that are equivalent to $\frac{2}{3}$. Your student can use skip counting or multiplication.

Answer: ($\frac{2}{3}$ is equivalent to $\frac{4}{6}, \frac{6}{9}, \frac{8}{12},$ and $\frac{10}{15}$)

7. Your student can order sets of fractions by making common denominators. Have your student create equivalent fractions to compare and order sets of fractions.

Set 1: $(\frac{1}{3}, \frac{2}{3}, \frac{3}{4}, \frac{5}{6})$ **Set 2:** $(\frac{5}{3}, \frac{7}{9}, \frac{2}{3}, \frac{5}{12})$

8. Your student can represent decimals in different ways, including diagram, decimal, and fraction form. To test this, have your student fill in the table to represent the decimal using a diagram, decimal form, and fraction form.

One and three hundredths: *The diagram will have one grid fully shaded in, and three squares shaded in. The decimal is 1.03.*

Seven tenths: *The fraction is $\frac{7}{10}$ and the decimal 0.7.*

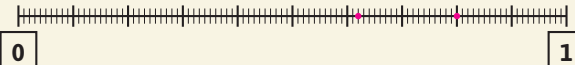
Forty-five hundredths: *The diagram has four columns and five small squares shaded in. The fraction is $\frac{45}{100}$.*

9. Your student can round decimals to the nearest tenth and whole number. Have your student complete the problems on the student activity page. Your student can use the number line to help her.

Rounding 1: *(0.6 rounds to 1)* **Rounding 2:** *(0.13 rounds to 0.1)*

10. Your student can compare decimals on a number line. Have your student place the decimal numbers on the number lines. Then, use the number lines to compare the decimals and add a comparison symbol to make the statement true.

Comparison 1: $(0.92 > 0.09)$ 

Comparison 2: $(0.8 > 0.62)$ 

11. Your student can order decimals from least to greatest or greatest to least. Have your student list the decimals in the correct order on the student activity page.

Set 1: 2.20, 2.25, 2.28, 2.31 **Set 2:** 5.4, 5.29, 5.17, 4.99

12. Your student can multiply a multi-digit whole number by a one-digit whole number and multiply a two-digit whole number by a two-digit whole number. To test this, have your student find the product on the student activity page.

Answer: $(2,459 \times 3 = 7,377, 46 \times 29 = 1,334)$

13. Your student can find whole-number quotients and remainders with multi-digit dividends. To test this, have your student find the quotient on the student activity page.

Answer: $(8,424 \div 9 = 936, 1,941 \div 4 = 485 R 1)$

14. Your student can interpret the meaning of remainders in division story problems that represent real-world situations. Have your student find the quotient and interpret the remainder.

Situation 1: *(They need 21 groups because $143 \div 7 = 20$ R3, and those 3 people cannot be left behind, so there needs to be one more group to involve all of the people.)*

Situation 2: *(Jacob will have 15 full pages. $126 \div 8 = 15$ R 6. Since the question asks about how many full pages, the answer is 15.)*

15. Your student can multiply a whole number by a fraction. Have your student find the product. Your student can use a tape diagram if she would like.

Answer: $7 \times \frac{1}{3} = \frac{7}{3}$ $8 \times \frac{7}{10} = \frac{56}{10}$

16. Your student can add and subtract fractions with the same denominator. To test this, have your student find the sum or difference on the student activity page.

Answer: $4\frac{7}{10} - 2\frac{4}{10} = 2\frac{3}{10}$ $\frac{7}{12} + \frac{3}{12} = \frac{10}{12}$
 $3\frac{1}{4} - 1\frac{3}{4} = 1\frac{2}{4}$ $\frac{3}{4} + 1\frac{1}{4} = 1\frac{4}{4}$ or 2

17. Your student can identify lines, segments, and rays. Have your student use the word bank to write the correct name of each figure on the blank.

Answer: *(segment, parallel lines, ray, line)*

18. Your student can analyze, describe, extend, and generate visual and numerical patterns. To test this, have your student answer questions about the patterns on the student activity page.

Pattern 1: *(The next three shapes in the pattern are a green square, purple rectangle, green square. The 11th shape will be a green square.)*

Pattern 2: *(The next two numbers in the pattern are 125 and 625. The rule is $x5$.)*

19. Your student can represent and solve multiplicative comparison problems, including those involving unknown factors. To test this, have your student write the equation to represent the story problem and then solve the story problem.

Story Problem 1: *(The equation is $3 \times 4 = 12$. She baked 12 loaves of bread on Tuesday.)*

Story Problem 2: *(The equation is $24 \div 6 = 4$ or $4 \times 6 = 24$. Jamal baked 4 loaves of bread.)*

20. Your student can solve multistep problems involving the four operations. To test this, have your student make a model or write an equation to represent each problem and then solve to find the answer.

Story Problem 1: ($10 \times 125 = 1,250$. $208 \times 6 = 1,248$. $1,250 - 1,248 = 2$ tickets. Marley earned two more tickets than Zoe.)

Story Problem 2: ($3,420 - 1,150 = 2,270$. $2,270 \div 5 = 454$. Each bracelet costs 454 tickets.)

21. Your student can identify shapes and features of shapes. To test this, have your student complete the table on the student activity page.

Answers: (*acute triangle, acute angle, right triangle, obtuse angle, right angle*)

22. Your student can convert between different units of measurement. Have your student complete the table on the student activity page.

32 cups: 16 pints, 8 quarts, 2 gallons

72 feet: 864 inches, 24 yards

2,000,000 milligrams: 2,000 grams, 2 kilograms

1,000,000 millimeters: 100,000 centimeters, 1,000 meters, 1 kilometer

23. Your student can solve story problems that involve intervals of time. To test this, have your student complete the story problems on the student activity page.

Answers: (*5:55 PM, 2:30 PM, 2 hours and 45 minutes*)

How did your student do?

- If your child could easily complete 21 or more of the 23 skills, begin Level 5.
- If just one or two areas were difficult, you can remediate in those areas as you start Level 5.
- If 20 or fewer boxes were checked, start with Level 4 to build a strong foundation for math..

If you have any questions about the program or would like to learn how to adapt certain aspects to accommodate your child's needs, please contact us at support@allaboutlearningpress.com or 715-477-1976. And if you need ideas on how to help your child build skills, just let us know—we are always happy to help!



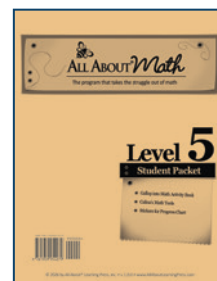
Gather the Materials

In addition to this teacher's manual, you will need the following items:

1 Student Packet

The Student Packet contains:

- *Gallop into Math!* activity book
- Stickers for the Progress Chart
- *Calina's Math Tools* (See page 27, Preview *Calina's Math Tools*, for more details)



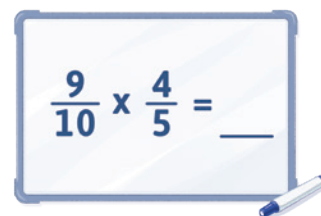
2 All About Math Manipulatives Kit

The manipulatives kit includes hands-on materials to support learning. See page 25, Learn about Manipulatives, for more details about the manipulatives for Level 5.



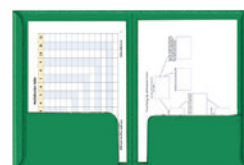
3 Dry-erase board and Markers

You can use any size. We recommend a hand-held dry-erase board for ease in demonstrating concepts. However, if you already have a dry-erase board for *All About Reading* or *All About Spelling*, you can also use your existing board.



4 Folders (Optional)

It's helpful to have a folder for storing *Calina's Math Tools*. You may also want a folder for storing *Calina's Math Fun!* games so they can be replayed.





The *All About Math* Method

First of all, you can do this! *All About Math* is a scripted, open-and-go program developed for busy parents, teachers, and tutors who want to teach mathematics in the most effective way possible. This program doesn't require long periods of study, you don't have to develop your own lesson plans, and you don't have to stress over what to teach next—because everything is laid out for you, step-by-step. You'll get a solid grounding in how to teach mathematics without being overwhelmed.

Your student will be actively involved in the learning process. This is a truly multisensory program; your student will learn through sight, sound, and touch. Everything is taught in context, and your student will apply what he has learned right away. Your student will be engaged in thinking, processing, comparing, and learning.

Students who use the *All About Math* method tend to feel a sense of excitement in learning. And they should! They are learning how to think, explore, and grow in their abilities. They will feel successful as they see continual progress.

There are no gaps in this program. *All About Math* teaches your student everything he needs to know to build a strong foundation of numeracy, operations, and algebraic thinking. Each concept builds upon the previous one, ensuring a comprehensive understanding that leverages existing knowledge.

***All About Math* acknowledges the diverse needs of learners and addresses the five key components of effective instruction:**

1. **Strong Conceptual Understanding:** We connect mathematical concepts, fostering a deeper understanding that transcends memorization.
2. **Procedural Fluency and Skills:** Students master essential skills like multiplication, division, and fractions through practice and application.
3. **Communication and Collaboration:** We encourage students to explain their reasoning, fostering collaboration and clear communication through discussions and activities.
4. **Assessment and Differentiation:** Our program offers regular assessments so you can see how your student is doing. It allows you to cater to individual needs by offering differentiated instruction; instruction that allows you to adjust the pace, complexity, and activities to your student's needs.
5. **Positive Learning Environment:** We encourage students to believe in their ability to learn and grow through perseverance and effort.

***All About Math* is a mastery-based program.** As such, the levels don't necessarily correspond to grade levels. In mastery-based learning, students master foundational concepts before moving on to more advanced concepts, regardless of age or grade level. Some concepts will take many lessons to master. The instructions in each lesson help you know whether to move on, while the concept reminders on the *Daily Review Tracker* help you continue to work toward mastery.

Most importantly, *All About Math* is committed to results. The *All About Math* program has a very focused mission: to enable you to teach your student mathematics while guaranteeing retention and enjoyment. Our approach to mathematics focuses on enabling students to become confident, fluent mathematicians who can absorb and retain new information.

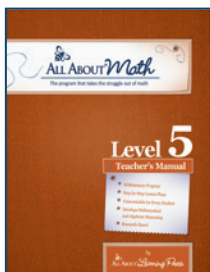
If you ever have a question as you are teaching, please feel free to contact us at support@allaboutlearningpress.com or 715-477-1976.

We're here to help!



Preview the Teacher's Manual

As you flip through the teacher's manual, you'll notice that all the lessons are laid out for you step-by-step. You'll also find two types of lessons:



- **New Concept Lessons:** In these lessons, your student will learn new skills and concepts. You can see an example of a typical “New Concept” lesson in Lesson 3 on page 57.
- **Progress Monitoring Lessons:** In the Show What You Know! lessons, your student will review and practice the new concepts taught in the previous lessons. You can see an example of a typical Progress Monitoring lesson in Lesson 10 on page 123.

Each new concept lesson consists of six parts:

1. **Before You Begin:** This cream-colored box contains an overview of the lesson and is meant only for you, the teacher. Reading it takes only a few minutes, after which you'll be well-equipped to teach the lesson confidently.
2. **Review:** You will begin the lesson by reviewing concepts learned previously, giving your student a quick review of skills or concepts essential to the new learning. Starting in lesson 7, you will need your student's *Daily Review Tracker* for this part of the lesson.
3. **New Teaching:** This is the hands-on, multisensory portion of the lesson. Your student will work with the manipulatives as you gradually introduce new concepts. Scaffolding techniques such as modeling, guided practice, and feedback help students progress at their own pace and achieve a deeper understanding.

Then, your student will use activity sheets as she continues to practice the new concepts. The activities encourage teachers to highlight connections, helping students see the bigger picture and develop a more coherent understanding of mathematical concepts.

Finally, Math Reflections encourages your student to ask questions and express her understanding. This allows the teacher to identify any misconceptions and address them directly.

(See page 19, Math Reflections and Dialogue, for more details)

4. **Extended Practice:** Optional activities are included for students who need more practice. By revisiting and practicing the skills in different ways if needed, students develop fluency and automaticity, allowing them to solve problems and perform calculations with greater accuracy and speed.
5. **Calina's Math Fun!:** Fun and engaging activities provide opportunities for students to use and apply the new concepts they have learned in a meaningful context. This helps them move the information from short-term to long-term memory, strengthening their understanding

and improving their ability to recall and apply concepts later. These activities are designed to encourage playing more than once to reinforce concepts and skills.

6. **Track Your Progress:** At the end of each lesson, record your student's progress on the Progress Chart.

Take a few minutes to flip through the Appendices section starting on page 525. The Appendices include a few extra resources to help you and your student get the most out of your math lessons.



Math Reflections and Dialogue

It's incredibly important for children to talk about what they are learning in math. Verbalizing their thinking helps deepen their understanding, build critical reasoning skills, and strengthen their ability to communicate complex ideas. That is why you will find "Math Reflection" sections in every *All About Math Lesson*, and you will also see dialogue encouraged throughout. Here are some key benefits of encouraging math discussions:

Math Reflection:

"Let's Reflect!"

Ask some questions to guide your student's reflection:

- "What does the numerator in a fraction tell you when you're dividing something?"
- "What does the denominator in a fraction tell you?"
- "How is $1 \div 2$ the same as $\frac{1}{2}$?"

This section is located after the Complete Activity Sheet section in each New Concept Lesson and after the last question in each Progress Monitoring Lesson.

Deepens Understanding: When your student talks through a problem, he is forced to clarify his thinking. Explaining his reasoning helps solidify the concepts in his own mind, making it easier for him to understand and retain the material. Talking through math problems can also reveal misunderstandings or gaps in knowledge. If he is unable to explain his thinking, it may highlight areas where he will need further instruction or support.

Encourages Active Engagement: Math discussions help your student move from passively receiving information to actively engaging with the material. When he verbalizes his thought processes, he is more likely to take ownership of his learning and develop a deeper connection to the content.

Promotes Critical Thinking and Problem Solving: Talking about math encourages your student to reason logically and justify his thinking. Discussing different strategies and approaches fosters critical thinking and can lead to deeper insights and a broader range of strategies for solving problems.

Enhances Mathematical Vocabulary: Talking about math helps your student develop and expand his mathematical vocabulary and encourages him to use specific, accurate language, which reinforces his understanding of the terms and concepts involved.

Improves Memory and Retention: When your student talks about math, he is engaging both the verbal and cognitive centers of the brain, which enhances memory and understanding. Explaining concepts to others forces him to organize and articulate his knowledge in a coherent way, and reinforces learning and retention.

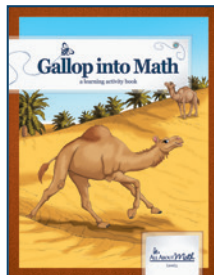
Encourages a Positive Attitude Toward Math: By encouraging your student to talk about his learning, you help him see math as a subject he can engage with and discuss, rather than a subject that is difficult or intimidating. Positive discussions about math help develop a healthy attitude toward the subject and can reduce math anxiety.

Talking about math in real-world contexts or through stories can help him see the relevance and practical applications of what he is learning, making math more engaging and meaningful.



Preview the Activity Book

The *Gallop into Math!* activity book contains:

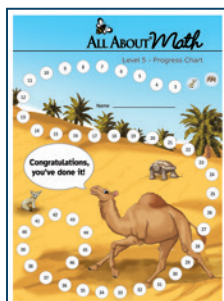


- Progress Chart
- *Daily Review Tracker*
- Activity Sheets
- Calina's Math Fun!
- Math Practice
- Story Problems and Situations
- Certificate of Achievement

The lesson plans in the teacher's manual will tell you which pages you need for each lesson. The pages in the activity book are perforated for easy removal.

Let's take a quick look at each part of the activity book.

Progress Chart



The *Progress Chart* can be found on page 5 of the activity book.

This chart is a fun and encouraging way to help students see their progress as they work toward understanding mathematics.

Remove the chart along the perforation and find a special spot to display it. You might choose a bulletin board, the refrigerator, a folder, or any other place that is easy to access and see.

After finishing each lesson, have your student color in or place a sticker over the corresponding circle on the chart. It is a great way to celebrate her hard work!

Daily Review Tracker

The *Daily Review Tracker* can be found on page 7 of the activity book.

Lesson	Topic	Skills	Mastered
1	Place Value	Identify the value of a digit in a number.	
2	Place Value	Read and write numbers to 100.	
3	Place Value	Read and write numbers to 1,000.	
4	Place Value	Identify the value of a digit in a number.	
5	Place Value	Read and write numbers to 10,000.	
6	Place Value	Read and write numbers to 100,000.	
7	Place Value	Read and write numbers to 1,000,000.	
8	Place Value	Read and write numbers to 10,000,000.	
9	Place Value	Read and write numbers to 100,000,000.	
10	Place Value	Read and write numbers to 1,000,000,000.	
11	Place Value	Read and write numbers to 10,000,000,000.	
12	Place Value	Read and write numbers to 100,000,000,000.	
13	Place Value	Read and write numbers to 1,000,000,000,000.	
14	Place Value	Read and write numbers to 10,000,000,000,000.	
15	Place Value	Read and write numbers to 100,000,000,000,000.	
16	Place Value	Read and write numbers to 1,000,000,000,000,000.	
17	Place Value	Read and write numbers to 10,000,000,000,000,000.	
18	Place Value	Read and write numbers to 100,000,000,000,000,000.	
19	Place Value	Read and write numbers to 1,000,000,000,000,000,000.	
20	Place Value	Read and write numbers to 10,000,000,000,000,000,000.	
21	Place Value	Read and write numbers to 100,000,000,000,000,000,000.	
22	Place Value	Read and write numbers to 1,000,000,000,000,000,000,000.	
23	Place Value	Read and write numbers to 10,000,000,000,000,000,000,000.	
24	Place Value	Read and write numbers to 100,000,000,000,000,000,000,000.	
25	Place Value	Read and write numbers to 1,000,000,000,000,000,000,000,000.	
26	Place Value	Read and write numbers to 10,000,000,000,000,000,000,000,000.	
27	Place Value	Read and write numbers to 100,000,000,000,000,000,000,000,000.	
28	Place Value	Read and write numbers to 1,000,000,000,000,000,000,000,000,000.	
29	Place Value	Read and write numbers to 10,000,000,000,000,000,000,000,000,000.	
30	Place Value	Read and write numbers to 100,000,000,000,000,000,000,000,000,000.	

This *Daily Review Tracker* is a tool for you to use with your student during the review section of each lesson. It helps build a strong foundation in mathematics by supporting concept retention and reinforcing understanding, while also tracking mastery of each skill.

Starting in Lesson 6, you will be prompted to enter the date next to skills that have been introduced. This will help you track which skills have been taught and should be included as part of your daily review.

In Lesson 7, you will begin using the tracker to identify areas where your student may need more practice to reach mastery. You will know she has achieved mastery when she can perform the skill consistently without assistance. Once she has demonstrated mastery, record the date in the 'Date Mastered' column.

As always, you are welcome to revisit any skill marked as mastered for a refresher or extra practice as needed.

Activity Sheets

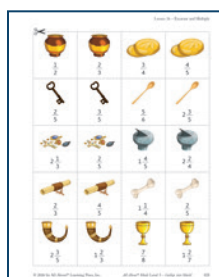
The activity sheets are highly motivating for most students, offering a variety of ways to practice the new concepts introduced in each lesson. They include engaging themes and colorful visuals that make learning both fun and meaningful.



Take a look at the activity called Framing the Masterpiece on page 78 of the activity book. In this activity, your student will sketch a rectangle on grid paper and then find the area and perimeter for each painting in the art gallery.

Calina's Math Fun!

Math games make learning math exciting by turning practice into play, allowing students to explore concepts in a fun and interactive way. They will build confidence and fluency with math concepts while keeping your student engaged and motivated.



Calina's Math Fun! can be found at the end of each new concept lesson. You can choose to play these games directly after the lesson or at another time. These games are designed to be played multiple times and are a great way to practice skills that are still developing.

Remove the Calina's Math Fun! games along the perforation. Once you have completed a game, place it in a safe spot or folder for easy access for later play.

Math Practice



Starting in Lesson 3, your student will complete short Math Practice pages to review and reinforce what they have already learned. These pages include practice problems that are designed to be quick and focused. Math Practice pages allow your student to keep important skills fresh without feeling overwhelmed, helping build confidence and strengthen understanding over time.

Story Problems and Situations



Story Problem and Situation pages give your student a chance to engage with real-world math in a meaningful way. These pages list story problems or situations used throughout the lesson, allowing your student to read along or read aloud. She can use the page to underline important numbers, highlight the question being asked, and mark anything else that helps her make sense of the problem.

Certificate of Achievement

The *Certificate of Achievement* can be found on page 387 of the activity book.



Presenting your student with a certificate upon completing the Level 5 program is a wonderful way to celebrate her hard work and achievements. It will boost her confidence and give her a sense of pride in reaching an important milestone.



Learn about the Manipulatives

We will be using four types of manipulatives. Below is an introduction to some of their uses.

Connecting Cubes can be snapped together to form longer chains or structures. They can be used for:

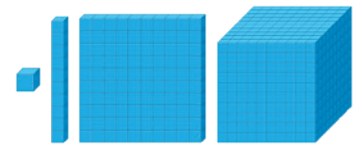


- **Multiplication and Division:** Connecting cubes can be used to model multiplication and division by creating equal groups or arrays. The cubes make it easier to see how multiplication works as repeated addition and how division works as sharing or grouping.
- **Fractions:** Different colored connecting cubes can show parts of a whole, compare fractions, or build fraction bars.

Two-Color Counters are small, circular discs that are red on one side and yellow on the other side. They can be used for basic addition and subtraction, making equal groups and arrays to demonstrate multiplication and division concepts, and as game markers.



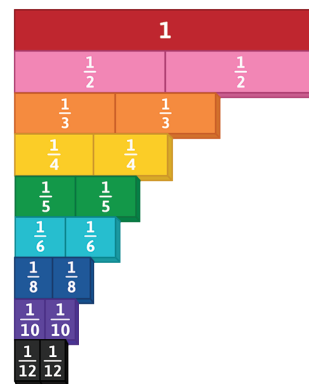
Base-10 Blocks also known as **place value blocks**, represent units of 1, 10, 100, and 1000. They can be used for:



- **Understanding Place Value:** Base-10 blocks are commonly used to help understand place value. Students can see how numbers and decimals are made by grouping the blocks together. Each type of block represents a different place value:
 - **Unit (ones):** Small cubes that represent the number 1 or 0.01.
 - **Rod (tens):** Long rods that represent groups of 10 or 0.1.
 - **Flat (hundreds):** Square flats that represent groups of 100 or one whole.
 - **Cube (thousands):** A cube that represents a group of 1000 or 10.
- **Multiplication and Division:** Using base-10 blocks helps students visualize the process of multiplication and division. Students can build arrays with the blocks to show how many groups there are and how many are in each group. The blocks help students break apart larger numbers into equal groups for division.

Fraction Tiles are colorful, rectangular pieces of different sizes that visually represent how parts make up a whole. They can be used for:

- **Reading and Writing Fractions:** Fraction tiles provide a visual representation of fractions as parts of a whole. For example, students can use the tiles to see that one out of four equal parts is written as $\frac{1}{4}$ and read as “one-fourth.”
- **Comparing Fractions:** Fraction tiles help students visually compare the sizes of different fractions. By lining up tiles representing parts of a whole, they can easily see which fractions are larger, smaller, or equal. For example, placing a $\frac{1}{2}$ tile above two $\frac{1}{4}$ tiles shows they are the same size.



Counting Bears are colorful, plastic bear-shaped manipulatives that can be used for game markers.

Ruler a straight tool with two sides: one marked in centimeters and the other in inches. While it's used to measure length and draw straight lines, it can also help students understand fractions. The inch side is divided into equal parts, like halves, fourths, and eighths, making it a useful tool for showing how fractions work on a number line.



Protractor a half-circle-shaped tool with numbers along the curved edge from 0° to 180° . There are numbers on the straight edge that can also be used as a ruler or straight edge. In the middle, it has a small hole that you line up with the point, or vertex, of an angle. A protractor is used to measure how wide an angle is in degrees.



The *All About Math* Manipulatives Kit also includes:

- **Dry Erase Pocket:** a transparent-plastic pocket that turns any Math Tool into a dry-erase board.
- **Counting Bears:** The Counting Bears were used in lower levels. However, kids who still enjoy them can use them for counting, addition, subtraction, creating patterns, multiplicative comparisons, or game markers.

The *All About Math* Manipulatives Kit comes in a plastic Storage Bin for ease and convenience.

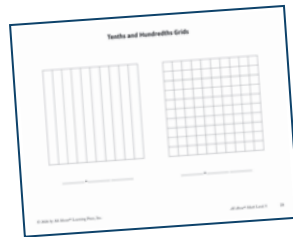
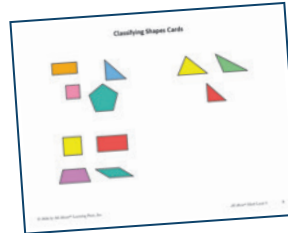




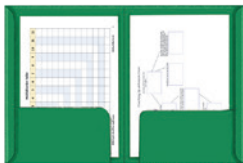
Preview Calina's Math Tools

Math Tools are printed resources that can be used in numerous ways to support student learning. In Level 5, Math Tools are primarily used to support operations and algebraic thinking. These tools include:

- Multiplication Table (0-12)
- Dot Paper
- Partial Quotient Division Mat
- Fractions and Decimals Mat
- Classifying Shapes Cards
- Decimal Mat
- Number Cards
- Shape Cards
- Classifying Quadrilaterals Chart
- Decimal Number Lines
- Decimal Place Value Chart
- Finding Simplest Form Mat
- Grid Paper
- Large Grid Paper
- Decimal Division and Multiplication
- Tenths and Hundredths Grid
- Table and Blank Grid
- Open Number Line
- Analyzing Patterns Mat
- Table and Labeled Grid
- Coin Cards
- Make a Cube
- Metric Conversions Chart
- Bar Graph Template
- Dot Plot/Line Plot Template



Math Tools are reused for many lessons, so once you use them, be sure to save them for future use.



Consider keeping the materials in a folder and storing them in a binder or in the manipulatives storage bin.



How Much Time Should I Spend on Math?

All About Math lessons are designed so that you can work at your student's pace. Here are some general guidelines.



Spend 20 minutes per day teaching math.

We recommend spending about 20 minutes per day, five days a week, on math instruction, but you can adjust this to meet your particular student's needs.

It can be helpful to set a timer. When 20 minutes are up, consider whether you have reached a logical stopping point in the lesson; you may want to complete the task or part of the task before stopping. Then, mark the spot in the lesson where you stopped. If your student is still engaged at the end of 20 minutes, feel free to extend the time if you wish.

When you begin teaching the next day, start with 1 or 2 items from the *Daily Review Tracker*, briefly review the New Teaching from the previous day, and then pick up in the teacher's manual where you left off previously. If your student struggles to remember previous learning, you can begin from an earlier point in the lesson.

Short daily lessons are much more effective than longer, less frequent lessons. Your student's attention is less likely to wander, and you can accomplish more when your student is actively engaged in the lesson.

If you aren't done with the lesson when the 20 minutes are up, don't worry! The next tip is for you.



Lessons often take more than one day to complete.

Please know that the lessons in *All About Math* are **not** meant to be completed in one day.

A number of variables, including your student's age, attention span, prior experience, the difficulty of the concept being taught, and the length of the lesson, all play a part in how quickly a lesson can be completed.

Teaching your student can be a wonderful way to show him that he has great value in your eyes. You can view this as an opportunity to build him up and help him develop skills and character. Can you see yourself as a calm, uncritical coach with the worthy goal of helping this child fulfill his natural potential? Imagine the type of teacher you would want: friendly, supportive, with a you-can-do-it attitude. Smile. Point out what your student has done right more often than you point out his mistakes. Treat lesson time as a special time between the two of you.

2

**Complete Step-by-Step
Lesson Plans**

Hi! I'm Calina!

I am so excited about Level 5 Math that I am galloping in to share it with you!

Did you think that camels were just dull creatures plodding slowly along in the desert?

Well, hang onto your hat because just like math isn't dull, camels aren't either!

In fact, camels and math are both pretty exciting.

Follow me and you'll see!



Lesson 5 Rounding Decimals

Objective

Your student will learn to round decimals to the nearest whole, tenth, and hundredth.

You Will Need

- Gallop into Math!* pages 31 and 32
- dry-erase board, pocket, and marker
- Decimal Number Lines, *Calina's Math Tools*
- Decimal Place Value Chart, *Calina's Math Tools*

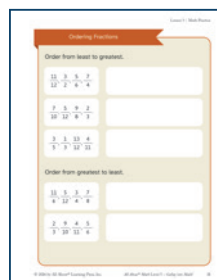
Before You Begin

Preview Rounding Decimals

In this lesson, your student will round decimals to the nearest whole number, tenth, and hundredth place. In the previous lesson, your student used place value charts and number lines to compare decimals to the thousandths place. She will continue to use these tools to round decimals. You can remind her that determining which number the decimal number is closer to will help with rounding. The rules for rounding decimal numbers are the same as for whole numbers; she is just working with new place values.

This lesson is important because sometimes we want to simplify a number by writing it with fewer decimal places than it initially contains. Learning to round decimals will allow her to practice this skill.

Review



Math Practice

Turn to page 31 in the *Gallop into Math!* activity book.

“Let’s review ordering fractions. First, look over the fractions to determine if you can use benchmarks to easily compare what numbers are more than one, close to one, less than half, and so on. If needed, rewrite some fractions as equivalent fractions using the same denominator in order to compare them. Finally, you will order the fractions from least to greatest or greatest to least.”

Review (continued)

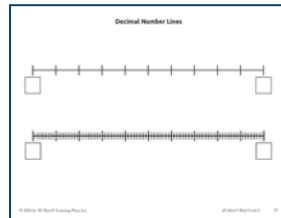
Answer Key

- $\frac{5}{6}, \frac{11}{12}, \frac{3}{2}, \frac{7}{4}$
- $\frac{5}{12}, \frac{2}{3}, \frac{7}{10}, \frac{9}{8}$
- $\frac{1}{3}, \frac{4}{11}, \frac{3}{5}, \frac{13}{12}$
- $\frac{11}{6}, \frac{7}{8}, \frac{3}{4}, \frac{5}{12}$
- $\frac{9}{10}, \frac{5}{6}, \frac{2}{3}, \frac{4}{11}$

Rounding Decimals with Hundredths

Write 12.87, 12.13, 12.51, and 12.08 in a list on the dry-erase board.

“In science class, Olivia recorded these numbers (point to the numbers) from an experiment. Read these numbers to me.” *Twelve and 87 hundredths, 12 and 13 hundredths, 12 and 51 hundredths, 12 and 8 hundredths.*



Decimal Number Lines

Find the *Decimal Number Lines* from *Calina's Math Tools*. Place it in the dry-erase pocket.

“Good. Each of these decimals has hundredths. We will round these numbers to the nearest

whole number. How can you use the hundredths number line (point to the bottom number line) to see which numbers are closer to 12 or 13?” *I can place each number on the number line. The numbers to the left are closer to 12, and the numbers to the right are closer to 13.*

“Yes. Use the hundredths number line to determine which numbers are closer to 12 and which are closer to 13. Which numbers round to 12, and which numbers round to 13?” *The numbers 12.08 and 12.13 are closer to 12, so they round down to 12. The numbers 12.87 and 12.51 are closer to 13, so they round up to 13.*

“Great. We will use the *Decimal Number Lines* to help us round more decimals.”

New Teaching

Rounding to the Nearest Whole Number

“Mount Washington in New Hampshire is the highest mountain on the eastern coast of the United States. The top of Mount Washington is known for its very high wind speeds. In this lesson, we will look at the wind speeds recorded throughout the year.

New Teaching (continued)

Let's start with the average wind speed for April, 35.613 miles per hour. We write 'mph' as the abbreviation for miles per hour."

Write 35.613 on a dry-erase board.

"What do you notice about this number?" *There are three numbers to the right of the decimal point.*

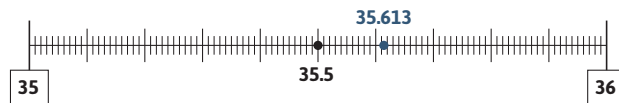
"Yes. This number has thousandths. In this lesson, you will work with numbers that may have a digit in the thousandth place."

"We will round this number to the nearest whole number using the number line. Rounding a number with thousandths to a whole number is just like rounding a number with hundredths to a whole number. What whole numbers is 35.613 between?" *35 and 36*

"Right. We will use the hundredths number line. Write 35 in the box on the left side of the number line and 36 in the box on the right side of the number line."

"Next, mark and label the halfway point between 35 and 36. How did you know?" *The halfway point is 35.5. I know this because one whole is equal to ten-tenths and half of that is five-tenths.*

"Now, plot the number 35.613 on the hundredths number line." *I found thirty-five and six-tenths. This number comes one hundredth and a little bit more after that, so I will plot it here.*



"Is this number closer to 35 or 36? How do you know?" *The number 35.613 is closer to 36. I know this because it's between 35.5 and 36.*

Thousands	Hundredths	Tens	Ones	Tenths	Hundredths	Thousandths

Decimal Place Value Chart

Find the *Decimal Place Value Chart* from *Calina's Math Tools*. Place it on the other side of the dry-erase pocket so that you can flip back and forth between the *Decimal Number Lines* and the *Decimal Place Value Chart*.

Place the *Decimal Place Value Chart* in front of your student.

"We can also use a place value chart to help us round to the nearest whole number." Write the number 25.542 on the dry-erase board.

New Teaching (continued)

“Write this number on the place value chart.”

Thousands	Hundreds	Tens	Ones	Tenths	Hundredths	Thousandths
		2	5	5	4	2

“Use the place value chart to round the number to the nearest whole number. How did you round?” *I circled the 5 in the ones place and underlined the 5 in the tenths place. I can use the tenths place to determine how to round. Five is exactly in the middle, so we round up just like numbers that are closer to the higher number. So, 25.542 rounds to 26.*

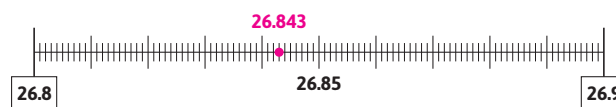
“Good. Let’s keep rounding with more wind speeds.” Clear the dry-erase board and both sides of the dry-erase pocket.

Rounding to the Nearest Tenth

Write 26.843 on a dry-erase board.

“In June, the wind speed for the month averaged 26.843 miles per hour. Round this number to the nearest tenth using a number line. Remember, rounding a number with thousandths to the nearest tenth is just like rounding a number with hundredths to the nearest tenth.

“Plot the number 26.843 on the number line. What is 26.843 rounded to the nearest tenth? How do you know?” *It’s 26.8. I know this because it is closer to 26.8 than 26.9 on the number line.*



Flip the dry-erase pocket over to the side with the *Decimal Place Value Chart*.

“Now, let’s round another number to the nearest tenth using the place value chart. Write the number 39.998 on the place value chart.”

Thousands	Hundreds	Tens	Ones	Tenths	Hundredths	Thousandths
		3	9	9	9	8

New Teaching (continued)

“Circle the digit in the tenths place and underline the digit in the hundredths place to help us round.” *(Answer: The nine in the tenths place is circled, the nine in the hundredths place is underlined.)*

“Good. What does the nine in the hundredths place tell you about rounding to the nearest tenth?” *It is closer to the higher number, so we must round up to the next number.*

“Yes. But, we can’t just turn a 9 into a 10 in the tenths place and leave everything else alone. Instead, we need to write a zero and write a 1 over to the ones place. Then, the 9 in the ones place becomes a 10, which makes the number 40. So the whole number goes up and rounds to 40.0. Write 40.0 on the dry-erase board.”

“Even though rounding is about just one place value, it can sometimes change more than one digit. That’s why place value is so important. Let’s keep going.”

Clear the dry-erase board and both sides of the dry-erase pocket.

Rounding to the Nearest Hundredth

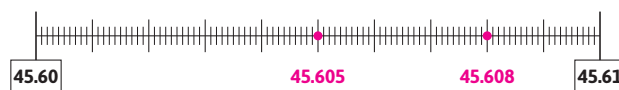
“In January, the average wind speed on Mount Washington was 45.608 miles per hour. Write 45.608 on the dry-erase board.”

“We want to round 45.608 to the nearest hundredth. When we rounded to the nearest tenth, we used the place value of the hundredths to help us determine if we should round up or down. What place value do you think we will look at when we round to the nearest hundredth?” *Thousandths.*

“Nice thinking! We will use the number line to help us round. First, we need to write a number in each box. Since we are rounding to the nearest hundredth, what should we write in the left box?” *Well, since 45.608 has 60 hundredths, we should write 45.60 in the left box.*

“What will go in the right box then?” *One more hundredth, so 45.61.*

“Yes, write those numbers in the boxes. Then, plot the point on the number line. How did you know where to plot?” *First, I put the halfway point, which is 45.605. Then, I counted on to eight and marked 45.608 on the eighth tick mark.*



“Great. Using the number line, what is this number rounded to the nearest hundredth?” *The number 45.608 rounds to 45.61 because it is closer to it.*

New Teaching (continued)

Flip the dry-erase pocket over to the side with the *Decimal Place Value Chart*.

“Now, let’s use place value to round another number to the nearest hundredth. Write the number 83.298 on the *Decimal Place Value Chart*.”

Thousands	Hundreds	Tens	Ones	Tenths	Hundredths	Thousandths
		8	3	2	9	8

“Which digit in which place will you circle and which will you underline?”
I’ll circle nine in the hundredths place, and I’ll underline the eight in the thousandths place..

“Yes, do that. How do you round this number?” *I look at the thousandths place, and it’s an 8, so I round the hundredths place up. The 9 in the hundredths place becomes 10, which makes the tenths place go up by 1. The rounded number is 83.30.*

“Good. Now, let’s see how you can round more decimals.” Have your student round each number to the nearest whole number, tenth, and hundredth using the *Decimal Number Lines* for one and the *Decimal Place Value Chart* for the other.

- Average wind speed in February: 44.983 (*Answer: nearest whole number: 45; nearest tenth: 45.0; nearest hundredth: 44.98*)
- Average wind speed in March: 39.812 (*Answer: nearest whole number: 40; nearest tenth: 39.8; nearest hundredth: 39.81*)

Complete Activity Sheet

“Let’s practice rounding to the nearest whole numbers, tenths, and hundredths.”

Month	Day	Wind Speed (mi/hr)	Round to Nearest Whole Number	Round to Nearest Tenth	Round to Nearest Hundredth
August	5	3.83			
August	10	8.912	9		
August	15	9.54			9.54
August	20	13.57	13		
August	25	11.915		11.9	
August	30	14.985			14.99

Wind Speed on Mount Washington

Turn to page 32 in the *Gallop into Math!* activity book.

“Now it’s your turn to be a wind speed expert! Let’s check out what the winds were like on Mount Washington in August and practice rounding.”

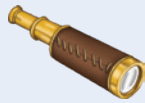
Have your student round each number to the nearest whole number, tenth, and hundredth using the tool of her choice.

New Teaching

(continued)

Answer Key

- August 5: 7 7.3 7.28
- August 10: 9.0 8.97
- August 15: 9 9.0
- August 20: 11.5 11.53
- August 25: 12 11.92
- August 30: 16 15.99



Look For

Your student may have trouble rounding when more than one digit changes.

Here's How to Help: Have your student label a number line and determine the endpoints each time she rounds, and then plot the number to make sure it's between those endpoints. Then she can determine which way to round the number.

Math Reflection

“Let's Reflect!”

Ask some questions to guide your student's reflection:

- “How can you use a number line to round a number to the nearest hundredth?”
- “How does a halfway point help with rounding using a number line?”
- “What is something you want to practice more?”

Extended Practice (optional)

If your student is not able to round decimals, or she expressed the need for more practice, continue working on this skill.

Have your student round each number to the nearest whole number, tenth, and hundredth using the *Decimal Number Lines* for some of the numbers and the *Decimal Place Value Chart* for the other numbers.

- 12.068
- 5.324
- 4.267
- 8.431
- 5.653
- 7.002
- 3.298

New Teaching

(continued)

Answer Key

12	12.1	12.07
5	5.3	5.32
4	4.3	4.27
8	8.4	8.43
6	5.7	5.65
7	7.0	7.00
3	3.3	3.30

Your student will continue practicing rounding decimals in future lessons. You can proceed to the next lesson without full mastery of the skill.

Calina's Math Fun!

Wind Speed Rounding

Let's practice our math skills!

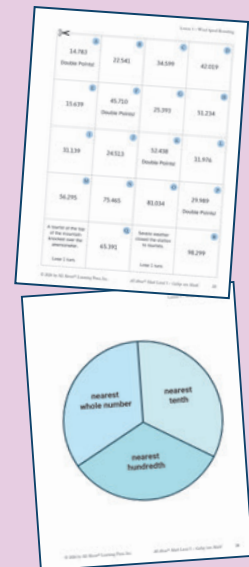
Materials

- Wind Speed Rounding cards, *Gallop into Math!* page 33
- Wind Speed Rounding spinner, *Gallop into Math!* page 35
- Connecting Cubes

(see Appendix B for Spinner Instructions)

Directions

1. Cut out the *Wind Speed Rounding* cards and place them face down in a stack.
2. Player 1 will draw a card, read the decimal number out loud, and spin the spinner. She will round the number on her card based on what she spins. For example, if she has the number 81.034 and spins "nearest whole number," she would round 81.034 to 81.
3. If Player 1 rounds the number correctly, she earns one point, unless the card says "Double Points!" Then she earns two points. She will keep track of her points using connecting cubes. If she is not correct, her turn ends. The card returns to the bottom of the stack whether she was correct or not.
4. Player 2 repeats the steps for her turn.
5. The first player to reach five points wins the game.

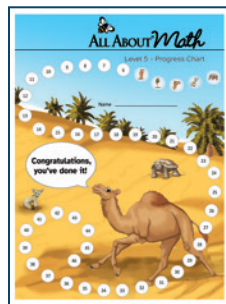


Answer Key

A: 15	14.8	14.78	J: 25	24.5	24.51
B: 23	22.5	22.54	K: 52	52.4	52.44
C: 35	34.6	34.60	L: 12	12.0	11.98
D: 42	42.0	42.02	M: 56	56.3	56.30
E: 16	15.6	15.64	N: 75	75.5	75.47
F: 46	45.7	45.71	O: 81	81.0	81.03
G: 25	25.4	25.39	P: 30	30.0	29.99
H: 51	51.2	51.23	Q: 65	65.4	65.39
I: 31	31.1	31.14	R: 98	98.3	98.30

Track Your Progress

Mark the Progress Chart



Have your student mark Lesson 5 on the Progress Chart.



Wow!

You're learning faster
than a desert wind!

I am so proud of you!

I guess now I'm going to have to
just keep on galloping or risk
getting lost in your
sandstorm!



Lesson 15 Using the Distributive Property to Explain Scaling

Objective

Your student will use the distributive property to reason about how much larger or smaller the scaling is when multiplied by a fraction greater than or less than 1.

You Will Need

- Gallop into Math!* pages 109 to 114 dry-erase board, pocket, and marker

Math Vocabulary

scaling

Before You Begin

Preview Using the Distributive Property to Explain Scaling

In this lesson, your student is introduced to the idea of scaling in multiplication. **Scaling** means resizing a quantity in equal proportions. Scaling in multiplication is similar to resizing an object.

In the last lesson, your student learned how multiplying a whole number by a fraction can make the value larger or smaller. Today, she will apply this idea to multiplying two fractions and use the distributive property to explain how much larger or smaller the product will be. The distributive property helps her understand how much the product changes.

This lesson builds a strong foundation for understanding the size of products and will help her in future lessons when she multiplies two fractions to find exact answers.

Review



The image shows a thumbnail of a 'Daily Review Tracker' table. The table has columns for 'Date', 'Skill', 'Review', and 'Master'. It contains several rows of text, likely representing different math skills to be reviewed daily.

Daily Review

As part of your math time each day, refer to your student's *Daily Review Tracker*. Choose one or two skills, and take a few minutes to practice.

Review (continued)



Math Practice

Turn to page 109 in the *Gallop into Math!* activity book.

“Let’s review how to solve division situations. Draw a diagram or write an expression to represent each situation. Then, find the quotient and simplify your answer.”

Answer Key

- $\frac{8}{12} = \frac{2}{3}$ of a jug of water
- $\frac{17}{10} = 1\frac{7}{10}$ apples
- $\frac{2}{4} = \frac{1}{2}$ of a carton of juice
- $\frac{128}{4} = 32$ fl. oz. = 4 cups

Comparing Size Without Multiplying

Write $\frac{2}{5} \times 7$ on the dry-erase board. “What do you know about this expression and the size of this fraction?” *We are multiplying a fraction by a whole number. The fraction is less than a whole.*

“Right! Using this knowledge, what can we determine about the product?” *The product will be less than seven because seven is being multiplied by a value less than one.*

Clear the dry-erase board. Write $\frac{7}{a} \times 4 > 4$. “When you look at this expression, what does it tell you?” *It tells me that the value of a fraction, with an unknown denominator, multiplied by four is greater than four.*

“Right. What are two different numbers that the denominator could be?” Your student may suggest any two numbers from one through six.

“Nice job! Why could the denominator not be ten?” *Because then the fraction would have a value less than one. Multiplying $\frac{7}{10}$ by four will equal something less than four, not greater.*

Clear the dry-erase board.

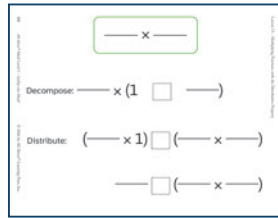
New Teaching

Using the Distributive Property to Explain Scaling Up

“In the last lesson, we noticed that multiplying by a fraction less than one makes the product smaller, multiplying by one keeps it the same, and multiplying by a fraction greater than one makes it bigger. This

New Teaching (continued)

is called scaling. **Scaling** means changing the size of something by multiplying every part by the same number. If we multiply by 2, it becomes twice as big. If we multiply by $\frac{1}{2}$, it becomes half the size. Today, we will use the distributive property to help us figure out exactly how much larger or smaller something becomes when we scale it.”



Multiplying Fractions with the Distributive Property

Remove page 110 from the *Gallop into Math!* activity book. Place it into the dry-erase pocket.

“We can use this tool to help us understand scaling.”

“As we explore more about the distributive property, we will also pretend to attend a neighborhood meeting that will share plans for developing a new dog park in the community. By using scaled drawings and models, the meeting gives the neighbors an idea of what the park will look like when complete. Some items have been enlarged to show details, while others have been reduced in size to provide a better view of the entire project. The first display is a poster for proposed plants to use in the landscaping by the entrance sign.” Write $\frac{3}{4} \times \frac{5}{3}$ in the top box of the *Multiplying Fractions with the Distributive Property* page.

$$\frac{3}{4} \times \frac{5}{3}$$

Decompose: — x (1 □ —)

Distribute: (— x 1) □ (— x —)

— □ (— x —)

“The petals on the flowers that the project leaders have chosen are $\frac{3}{4}$ of an inch (point to $\frac{3}{4}$). This expression shows that the petals of the flower have been multiplied by $\frac{5}{3}$ to be displayed on the poster. Do you think that will make them larger or smaller than their actual size?” *Larger.*

“Right. We are multiplying by an improper fraction, which is greater than one, so the model is being scaled up. Let’s use the distributive property to find out how much is added. First, we need to break apart or decompose $\frac{5}{3}$. How would we express $\frac{5}{3}$ as a mixed number?” *The mixed number is $1\frac{2}{3}$.*

“Right! $\frac{5}{3}$ is 1 plus $\frac{2}{3}$.” Write $\frac{3}{4} \times (1 + \frac{2}{3})$ on the page.

$$\frac{3}{4} \times \frac{5}{3}$$

Decompose: $\frac{3}{4} \times (1 \boxplus \frac{2}{3})$

Distribute: (— x 1) □ (— x —)

— □ (— x —)

New Teaching

(continued)

“The next step is to distribute the numbers and write our new expression. To do that, we need to multiply $\frac{3}{4}$ by 1 and $\frac{3}{4}$ by $\frac{2}{3}$. (Draw arcs to show the distribution.) When we rewrite the expression, what sign will stay between the terms?” *The plus sign.*

Fill in the expression next to *Distribute*.

$$\begin{array}{l} \boxed{\frac{3}{4} \times \frac{5}{3}} \\ \text{Decompose: } \frac{3}{4} \times (1 \oplus \frac{2}{3}) \\ \text{Distribute: } (\frac{3}{4} \times 1) \oplus (\frac{3}{4} \times \frac{2}{3}) \\ \quad \quad \quad - \square (- \times -) \end{array}$$

“Now let’s solve the first part. What is $\frac{3}{4} \times 1$?” *It is $\frac{3}{4}$.*

$$\begin{array}{l} \boxed{\frac{3}{4} \times \frac{5}{3}} \\ \text{Decompose: } \frac{3}{4} \times (1 \oplus \frac{2}{3}) \\ \text{Distribute: } (\frac{3}{4} \times 1) \oplus (\frac{3}{4} \times \frac{2}{3}) \\ \quad \quad \quad \frac{3}{4} \oplus (\frac{3}{4} \times \frac{2}{3}) \end{array}$$

“Right. To determine how much the flowers have been enlarged on the poster, we can use the expression we have created after distributing. What do you notice about the fractions in this new expression?” *The first two fractions are the same; they are both $\frac{3}{4}$.*

“Yes. We know that the product of $\frac{3}{4}$ and $\frac{5}{3}$ has to be more than $\frac{3}{4}$. The final expression shows us that. We have $\frac{3}{4}$ and then we are adding more to it. How much more?” *It will be $\frac{3}{4} \times \frac{2}{3}$ more.*

“That’s correct. The original flower petals were $\frac{3}{4}$ of an inch, and then they were scaled by $\frac{5}{3}$, so now they will be larger. $\frac{2}{3}$ of the original was added! The flowers have been enlarged from their actual size so we can see the details.” Clear the dry-erase pocket.

Using the Distributive Property to Explain Scaling Down

“At the meeting, we also saw a model of a park map sign that will be placed in the new dog park.” Write $\frac{4}{6} \times \frac{2}{5}$ in the top box on the *Multiplying Fractions with the Distributive Property* page.

“The sign is $\frac{4}{6}$ of a yard long. The creators multiplied its length by $\frac{2}{5}$ for the model. Do you think that will make the model larger or smaller than its actual size? Explain your thinking.” *I think the model*

New Teaching (continued)

will be smaller because when it was scaled up, we multiplied by a fraction larger than one. Here we are multiplying by a fraction smaller than one.

“Right. We are multiplying by a fraction that is less than one whole, so the model will be scaled down. Let’s use the distributive property to find out how much will be removed. We will still use one, but our other measurement is less than one. Draw a model on the dry-erase board to represent $\frac{2}{5}$. That will help us determine how we can represent the value in the expression.”



“We can use subtraction to think about your model. There is one whole, and if we subtract the unshaded parts, $\frac{3}{5}$, that leaves us with the fraction $\frac{2}{5}$. Let’s represent this with an expression next to *Decompose*.” Lead your student to write the expression $\frac{4}{6} \times (1 - \frac{3}{5})$.”

$$\frac{4}{6} \times \frac{2}{5}$$

Decompose: $\frac{4}{6} \times (1 - \frac{3}{5})$

Distribute: $(- \times 1) - (- \times -)$

$$- - (- \times -)$$

“Now, we need to distribute and write the new expression. Draw arcs to show the distribution of $\frac{4}{6}$ to the decomposed fraction, and fill in the new expression next to *Distribute*.” (*Answer:* $(\frac{4}{6} \times 1) - (\frac{4}{6} \times \frac{3}{5})$)

“Good. Now find the product of the first parenthesis, $\frac{4}{6} \times 1$, and complete the expression at the bottom.”

$$\frac{4}{6} \times \frac{2}{5}$$

Decompose: $\frac{4}{6} \times (1 - \frac{3}{5})$

Distribute: $(\frac{4}{6} \times 1) - (\frac{4}{6} \times \frac{3}{5})$

$$\frac{4}{6} - (\frac{4}{6} \times \frac{3}{5})$$

“Let’s look at our work. Again, I notice that the first two fractions are the same, $\frac{4}{6}$. What do you notice that is different?” *There’s a minus sign. We’re subtracting.*

“Right. Since we are subtracting an amount from $\frac{4}{6}$, the answer must be less than $\frac{4}{6}$. That tells us the sign was made smaller to create a model. The sign was scaled by $\frac{2}{5}$, and the $\frac{3}{5}$ shows how much of the original sign was removed.” Clear the dry-erase pocket.

“How does breaking apart the second factor using one whole help us make a comparison?” *It helps you see if you’re adding a value or taking it away from the first factor.*

New Teaching (continued)

Write the following expressions on the dry-erase board one at a time to continue practicing using the distributive property to explain scaling. Allow your student to use the *Multiplying Fractions with the Distributive Property* page. Have her decide if the scaled model would be larger or smaller, state the scale, and then describe how much of the original amount is added or removed. Ask her to explain her thinking.

- $\frac{1}{2} \times \frac{6}{4}$ (Answer: larger, scaled by $\frac{6}{4}$, $\frac{2}{4}$ of the original was added)
- $\frac{2}{5} \times \frac{9}{5}$ (Answer: larger, scaled by $\frac{9}{5}$, $\frac{4}{5}$ of the original was added)
- $\frac{4}{12} \times \frac{3}{4}$ (Answer: smaller, scaled by $\frac{3}{4}$, $\frac{1}{4}$ of the original was removed)

Complete Activity Sheet

“Let’s practice using the distributive property to explain scaling.”

Park Planning

Remove pages 111 and 112 from the *Gallop into Math!* activity book.

“Fill in the blanks and circle the correct answers. Use the

distributive property to help you decide if the model is larger or smaller than the original, state the scale, and say how much of the original is added or removed. Choose one problem on front to share your reasoning. Try it without using the *Multiplying Fractions with the Distributive Property* page for the last two questions on the back.”

Answer Key

The park leaders created a model by multiplying $\frac{2}{3} \times \frac{8}{6}$.

$$\frac{2}{3} \times \frac{8}{6}$$

$$\frac{2}{3} \times (1 + \frac{2}{6})$$

$$(\frac{2}{3} \times 1) + (\frac{2}{3} \times \frac{2}{6})$$

$$\frac{2}{3} + (\frac{2}{3} \times \frac{2}{6})$$

The product will be **larger** than $\frac{2}{3}$.

It was scaled by $\frac{4}{3}$.

$\frac{1}{3}$ of the original was **added**/removed.

$$\frac{3}{5} \times \frac{2}{6}$$

$$\frac{3}{5} \times (1 - \frac{4}{6})$$

$$(\frac{3}{5} \times 1) - (\frac{3}{5} \times \frac{4}{6})$$

$$\frac{3}{5} - (\frac{3}{5} \times \frac{4}{6})$$

The product will be: **larger** or **smaller**.

It was scaled by $\frac{1}{3}$.

$\frac{2}{3}$ of the original was **added**/removed.

$$\frac{5}{8} \times \frac{19}{12}$$

$$\frac{5}{8} \times (1 + \frac{7}{12})$$

$$(\frac{5}{8} \times 1) + (\frac{5}{8} \times \frac{7}{12})$$

$$\frac{5}{8} + (\frac{5}{8} \times \frac{7}{12})$$

The product will be: **larger** or **smaller**.

It was scaled by $\frac{19}{12}$ or $1\frac{7}{12}$.

$\frac{7}{12}$ of the original was **added**/removed.

The park leaders created a model by multiplying $\frac{1}{4} \times \frac{10}{12}$.

$$\frac{1}{4} \times \frac{10}{12}$$

$$\frac{1}{4} \times (1 - \frac{2}{12})$$

$$(\frac{1}{4} \times 1) - (\frac{1}{4} \times \frac{2}{12})$$

$$\frac{1}{4} - (\frac{1}{4} \times \frac{2}{12})$$

The product will be **less** than $\frac{1}{4}$.

It was scaled by $\frac{5}{6}$.

$\frac{1}{6}$ of the original was **added**/removed.

$$\frac{9}{10} \times \frac{15}{10}$$

$$\frac{9}{10} \times (1 + \frac{5}{10})$$

$$(\frac{9}{10} \times 1) + (\frac{9}{10} \times \frac{5}{10})$$

$$\frac{9}{10} + (\frac{9}{10} \times \frac{5}{10})$$

The product will be: **larger** or **smaller**.

It was scaled by $\frac{3}{2}$ or $1\frac{1}{2}$.

$\frac{1}{2}$ of the original was **added**/removed.

$$\frac{1}{2} \times \frac{1}{3}$$

$$\frac{1}{2} \times (1 - \frac{2}{3})$$

$$(\frac{1}{2} \times 1) - (\frac{1}{2} \times \frac{2}{3})$$

$$\frac{1}{2} - (\frac{1}{2} \times \frac{2}{3})$$

The product will be: **larger** or **smaller**.

It was scaled by $\frac{1}{3}$.

$\frac{2}{3}$ of the original was **added**/removed.

New Teaching (continued)



Look For

Your student might struggle to determine how to break the second factor apart using one whole.

Here's How to Help: Have your student make models to help determine the size of the second factor.

Math Reflection:

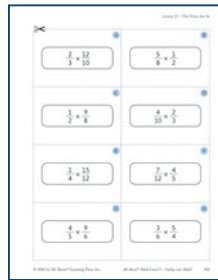
“Let’s reflect!”

Ask some questions to guide your student’s reflection:

- “How does the size of the second factor help you decide if the product is scaled up, scaled down, or stays the same?”
- “How did the distributive property help you explain scaling?”

Extended Practice: (optional)

If your student cannot use the distributive property to explain scaling, or if she expresses the need for more practice, continue working on this skill.



The Votes Are In

Remove page 113 from the *Gallop into Math!* activity book. Cut apart the cards, and place them in a stack face down.

“At the community meeting, members voted on whether to add a splash pad to the dog park. Flip each vote card and decide whether the expression would create a larger or smaller scaled model. Then use the *Multiplying Fractions with the Distributive Property* page to find the scale and describe how much of the original is added or removed.”

“Cards where the scale is larger count as a *YES* vote. Cards where the scale is smaller count as a *NO* vote. Sort the cards to determine whether the splash pad will be included in the dog park plans.”

If your student needs support, ask:

- “What does the second fraction in the expression tell you about the scaling of the model?”
- “How can you use the distributive property to write a different expression to determine the scaling?”
- “What does the addition or subtraction sign tell us about the size of the model?”

New Teaching

(continued)

Answer Key

- A: larger, scaled by $\frac{12}{10}$, $\frac{2}{10}$ was added
- B: smaller, scaled by $\frac{1}{2}$, $\frac{4}{8}$ was removed
- C: larger, scaled by $\frac{9}{8}$, $\frac{1}{8}$ was added
- D: smaller, scaled by $\frac{2}{3}$, $\frac{1}{3}$ was removed
- E: larger, scaled by $\frac{15}{12}$, $\frac{3}{12}$ was added
- F: smaller, scaled by $\frac{4}{5}$, $\frac{1}{5}$ was removed
- G: larger, scaled by $\frac{9}{6}$, $\frac{3}{6}$ was added
- H: larger, scaled by $\frac{5}{4}$, $\frac{1}{4}$ was added

This is the last lesson on scaling. Keep practicing this skill if it's difficult for your student. You may move on to the next lesson as you continue reviewing.

Calina's Math Fun!

Playing at the Dog Park

"Let's practice our math skills!"

Materials

- Playing at the Dog Park Scaling Cards, *Gallop into Math!* page 115
- Playing at the Dog Park Expression Cards, *Gallop into Math!* page 117
- Multiplying Fractions with the Distributive Property, *Gallop into Math!* page 110
- dry erase pocket and marker

Directions

1. Cut apart the *Playing at the Dog Park* scaling cards. Mix up the cards, and then give each player two cards. Place the remaining cards in a stack face down. Cut out the *Playing at the Dog Park* expression cards. Mix up the cards and place them in a separate stack face down.
2. Players will take turns choosing a *Playing at the Dog Park* expression card. Players can use the *Multiplying Fractions with the Distributive Property* page to help determine if the scaling would be larger or smaller and how much of the original is added or removed.
3. If she gives the correct answer of how much of the original is added or removed and has a card with the correct scaling, she gets to keep the dog (the expression card). She will then place the scaling card at the bottom of the stack and draw another scaling card from the top (players will always have two scaling cards during the game).
4. If she does not answer correctly or does not have the scaling card needed, she'll place the expression statement card at the bottom of the stack.
5. If a player has a scaling card that says *Your Choice!*, she may choose either the larger or smaller word to play, and she does not have to find how much larger or smaller.
6. The first player to collect five dogs, or expression cards, is the winner.



Answer Key

A: larger, $\frac{1}{2}$

B: larger, $\frac{2}{5}$

C: larger, $\frac{3}{5}$

D: smaller, $\frac{1}{12}$

E: smaller, $\frac{5}{8}$

F: smaller, $\frac{2}{3}$

G: larger, $\frac{2}{3}$

H: larger, $\frac{3}{4}$

I: larger, $\frac{5}{12}$

J: smaller, $\frac{8}{10}$

K: smaller, $\frac{2}{5}$

L: smaller, $\frac{9}{10}$

M: larger, $\frac{1}{5}$

N: larger, $\frac{3}{6}$

O: larger, $\frac{1}{2}$

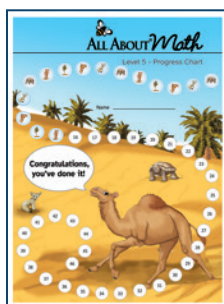
P: smaller, $\frac{7}{8}$

Q: smaller, $\frac{6}{10}$

R: smaller, $\frac{2}{4}$

Track Your Progress

Mark the Progress Chart



Have your student mark Lesson 15 on the Progress Chart..



Lesson 20 Multiplying Multi-digit Numbers Using the Standard Algorithm

Objective

Your student will learn to use the standard algorithm to multiply multi-digit numbers.

You Will Need

- Gallop into Math!* pages 149 to 152
- Multiplication Table, *Calina's Math Tools* (optional)
- Grid Paper, *Calina's Math Tools*
- dry-erase board, pocket, and marker

Before You Begin

Preview Using an Algorithm to Multiply

In this lesson, your student will learn the standard algorithm for multiplying multi-digit numbers. This method builds on his understanding of partial products, shifting the focus from breaking numbers apart to understanding the value of each digit based on place value.

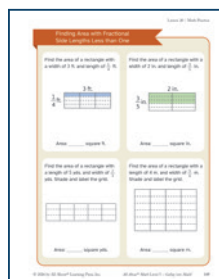
As you solve problems, connect each step of the algorithm to partial products and explain what each calculation represents.

Review



Daily Review

As part of your math time each day, refer to your student's *Daily Review Tracker*. Choose one or two skills, and take a few minutes to practice.



Math Practice

Turn to page 149 in the *Gallop into Math!* activity book.

“Let’s review finding the area of rectangles where one of the side lengths is less than one. Use the models to find the area of each rectangle. For the last two questions, find the area by shading and labeling each grid.”

Review
(continued)

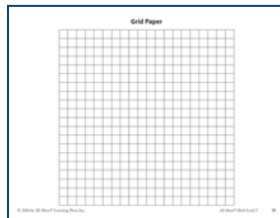
Answer Key

- $\frac{3}{4}$
- $\frac{10}{3} = 3\frac{1}{3}$
- $\frac{6}{5} = 1\frac{1}{5}$
- $\frac{20}{6} = 3\frac{1}{3}$

“Let’s learn about another strategy for multiplying.”

New Teaching

Multiplying by a One-Digit Factor



Grid Paper

Find the *Grid Paper* from *Calina’s Math Tools*. Place it into the dry-erase pocket.

Have the *Multiplication Table* from *Calina’s Math Tools* available for your student to use, if needed.

“Let’s imagine we are at a busy airport with thousands of people coming and going. At one gate, we see a small plane getting ready to take off to Charleston, South Carolina, and another plane headed to Orlando, Florida. Both planes have 43 passengers on board. We can use multiplication to help us determine how many people are flying on the planes.” Write $43 \times 2 = \underline{\quad}$ on the dry-erase board.

“Solve this problem on the dry-erase board using partial products.”
(*Answer: 86*)

2	40	+	3		80	+	6		86
	80		6						
					$43 \times 2 = 86$				

“Nice work! Let’s try another strategy and see if we get the same answer.” On the Grid Paper, rewrite the equation as shown:

			4	3		
		x		2		

“What do you notice about the way I have rewritten this problem?” Allow your student to share any observations he may have. Add the following observations if he doesn’t mention them:

- The numbers are stacked with the larger number on top.
- The ones are lined up.

New Teaching (continued)

- It looks similar to how we solve addition or subtraction problems, but there is a multiplication symbol.

“When we stack the numbers, we want to be sure to keep the numbers aligned by place value. The grid can help us keep our work organized by keeping the ones in one column and the tens in another column.”

“To find the product, we can multiply the factor on the bottom (point to the 2) by each digit in the factor 43. We’ll start by multiplying 2 by the number of ones in 43.” Circle the 3 in 43 and the 2 below it.

“What is the product of two and three?” *Six.*

“Yes, I will write six under the line to show that it is part of my answer. We need to be sure to keep it in the ones place because it is the product of the factors in the ones place.”

“Now, we multiply the 2 by the number in the tens place.” Circle the 4 in 43 and the 2 below it.

“What is 2×4 ?” *Eight.*

“Write an eight in the tens place of the answer because it is the product of a digit in the ones place times a digit in the tens place.”

“Our answer is 86 (point to 86). It’s the same answer as when you used partial products! This strategy is similar to using partial products, but also different. What do you notice?” Allow your student to share.

“We still multiplied 2 by each part of 43. First, we multiplied it by 3, and then we multiplied it by 4. However, when using partial products, we multiplied 2 by 40 instead of 4. Since we are using place value to organize our work with this new strategy, we do not need to multiply by the value of the digit. Instead, when we write 8 in the tens place, we know it has a value of 80.”

“Let’s try another one!” Clear the dry-erase pocket and dry-erase board.

“Another 3 planes are getting ready to take off. One is headed to Phoenix, Arizona, another to Seattle, Washington, and a third plane to Baltimore, Maryland. Each plane is full of 216 passengers. Let’s multiply to find how many people are on the planes altogether.”

New Teaching

(continued)

“When we stack the numbers, we will write the number with the most digits on top. This time, we have a three-digit number. Stack the numbers and set up the problem on the *Grid Paper*.”

		2	1	6		
	x			3		

“Good. Now, we are ready to multiply! Remember, we will multiply the bottom factor by each digit in the top number. Start in the ones place (circle the three and six). What is 3×6 ?” *Eighteen*.

“The number 18 is a two-digit number. When the result is a two-digit number, we do not write both digits in our answer. Think about when we stack numbers to add. What would we do if we added the ones and got a two-digit number like 18?” *Write eight below the line and add the ten by writing plus one above the tens place.*

If your student is unsure, write the problem $19 + 39$ stacked on the dry-erase board. Have him add the ones, and think about how he records a total of 18.



“That’s right! We’ll do the same thing when multiplying using this strategy. I’ll write an eight in the answer and write +1 above the tens place.”

			+1			
		2	1	6		
	x			3		
				8		

“Now, we will multiply the factor three by the digit in the tens place (circle the three and one). What is 3×1 ?” *Three*.

“Right. But don’t forget about the one ten (point to the +1). We’ll add one to the product. So, $3 + 1$ is 4. Write four in the tens place of the answer.”

“Now, let’s multiply three by the hundreds (circle the three and the two). What is 3×2 ?” *Six*.

“Yes. There are six hundreds; you can show this result by writing a six in the hundreds place of the answer.”

			+1			
		2	1	6		
	x			3		
		6	4	8		

“What is the product?” *The product is 648.*

“Good! Check your answer using partial products.” Your student should get the same answer, 648.

“So, there are 648 people on the planes getting ready to take off.”
Clear the dry-erase board and pocket.

Multiplying by a Two-Digit Factor

Write $12 \times 14 = \underline{\quad}$ on the dry-erase board.

“During the day, 12 flights are scheduled to fly to Los Angeles. Each flight currently has 14 empty seats. Let’s multiply to see how many seats are still available on these flights. Use partial products to find your answer.”

	10	+	2		100
10	100	20			20
+					40
4	40	8			+ 8
					168
					$14 \times 12 = 168$

“Now, let’s try the new strategy. The numbers we are multiplying both have two digits, so either one can go on top. I’ll put 12 on top.”

“Where do you think we should start?” *We need to multiply the four ones in the second factor by the two ones in the top factor.*

“Right. We’ll start multiplying this problem the same way we did the previous one. Multiply 4×2 and write the answer in the ones place.”

			1	2	
	x		1	4	
				8	

“Now, what should we multiply four by?” *One.*

“That’s it! Since we’re multiplying by the digit in the tens place, write the product also in the tens place.”

			1	2	
	x		1	4	
			4	8	

“Nice job! We’ve multiplied the 4 in 14 by the number of tens and ones in 12. Now, we need to multiply 1 ten in 14 by 12. Since the one is in the tens place, it really has a value of ten, not one. So, I’ll need to put a 0 in the ones place of my answer to act as a placeholder. We’ll do this each time we multiply by a two-digit number.”

			1	2	
	x		1	4	
			4	8	
				0	

New Teaching (continued)

“ 5×4 is 20. What should we do since the number is more than 10?”
Write 0 in the tens place and +2 above the 1 hundred.

“Yes. Complete that step of the problem.”

			+2			
		1	4	1		
	x		3	5		
			0	5		

“Now, multiply five by the one (point to the one in the hundreds place) and add the two (point to the +2). How many hundreds are there?” *Seven.*

“That’s right! So write a seven in the hundreds place of your answer. I will also cross out the two we added since it has already been used.”

			+2			
		1	4	1		
	x		3	5		
		7	0	5		

“Before we go to the three to multiply, what should we do?” *We need to place a zero.*

“Good. This 0 will keep the place values correct since we are really multiplying by 30 and not 3. Write a 0 underneath the 5 in 705.”

“Now multiply the 3 by each digit in 141.”

			+1			
			+2			
		1	4	1		
	x		3	5		
		7	0	5		
	4	2	3	0		

When multiplying 3×4 , your student will record the two and write +1 above the next place value. Be sure the 2 you added previously has been crossed out so your student doesn’t get confused.



“Way to go! Now, how do we find the product and what is it?” *Add 705 and 4,230 together. The product is 4,935.*

Have your student check his work using the partial product method.

“Your answers are the same! There are 4,935 seats in our terminal.”

Continue using the standard algorithm to practice multiplying multi-digit numbers. Use the *Grid Paper* to set up the problems to help your student keep his work organized.

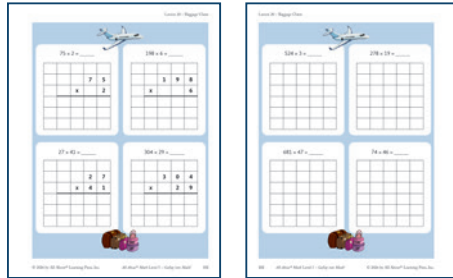
- $52 \times 3 = \underline{\quad}$ (Answer: 156)
- $436 \times 2 = \underline{\quad}$ (Answer: 872)

New Teaching (continued)

- $51 \times 24 = \underline{\hspace{2cm}}$ (Answer: 1,224)
- $205 \times 17 = \underline{\hspace{2cm}}$ (Answer: 3,485)
- $743 \times 58 = \underline{\hspace{2cm}}$ (Answer: 43,094)

Complete Activity Sheet

“Let’s practice multiplying multi-digit numbers!”



Baggage Claim

Turn to pages 151 and 152 in the *Gallop into Math!* activity book.

“Find your bags at the airport by solving for each product. Use the new strategy we learned in this

lesson to find your answer. You can use your *Multiplication Table* to help, if you’d like.”

Answer Key

- $75 \times 2 = 150$
- $198 \times 6 = 1,188$
- $27 \times 41 = 1,107$
- $304 \times 29 = 8,816$
- $524 \times 3 = 1,572$
- $278 \times 19 = 5,282$
- $681 \times 47 = 32,007$
- $74 \times 46 = 3,404$



Look For

Your student might forget a step in using the algorithm to find the product. He may also forget to add a zero placeholder before multiplying the second digit of a factor.

Here’s How to Help: Review the steps for multiplying using the algorithm. Help him understand that he must multiply each digit by another by circling each set of numbers as he multiplies. Have him solve a problem using partial products, and compare the numbers in each method to help with understanding the need for the zero placeholder.

Math Reflection

“Let’s reflect!”

Ask some questions to guide your student’s reflection:

- “How is the multiplication strategy we learned today similar to, and different from, using partial products?”

New Teaching (continued)

- “Why do we have to put a zero in the ones place before multiplying by the tens digit when solving a two-digit multiplication problem?”
- “What was challenging to you at first, but after practicing, you now understand?”

Extended Practice (optional)

If your student is not able to use an algorithm to multiply, or if he expressed the need for more practice, continue working on this skill.

Have your student solve the following problems using the algorithm. Practice multiplying by one-digit numbers until your student feels confident with the steps of the algorithm before moving on to the problems using a two-digit factor. Use the *Grid Paper* to help your student keep his work organized. Provide additional support by having him solve some problems using partial products, and then use that method as a way to check his work when using the algorithm. Challenge him to explain the steps he is following using the algorithm and how using partial products is similar.

One-Digit Factor

- $34 \times 2 = \underline{\quad}$ (Answer: 68)
- $71 \times 5 = \underline{\quad}$ (Answer: 355)
- $207 \times 4 = \underline{\quad}$ (Answer: 828)
- $346 \times 8 = \underline{\quad}$ (Answer: 2,768)

Two-Digit Factor

- $40 \times 12 = \underline{\quad}$ (Answer: 480)
- $15 \times 26 = \underline{\quad}$ (Answer: 390)
- $607 \times 19 = \underline{\quad}$ (Answer: 11,533)
- $452 \times 38 = \underline{\quad}$ (Answer: 17,176)

Your student will continue practicing with an algorithm to multiply in future lessons. You can proceed to the next lesson without full mastery of the skill.

Mark the Daily Review Tracker



Write today's date next to the skill: Fluently multiply multi-digit whole numbers using the standard algorithm. Include these in your rotation of daily review items.

Calina's Math Fun!

Now Boarding

“Let's practice our math skills!”

Materials

- Now Boarding Equation Cards, *Gallop into Math!*, pages 153 to 156
- Now Boarding Product Cards, *Gallop into Math!*, pages 157 to 160
- Now Boarding Map, *Gallop into Math!*, page 161
- dry-erase pocket and markers (2 colors)

Directions

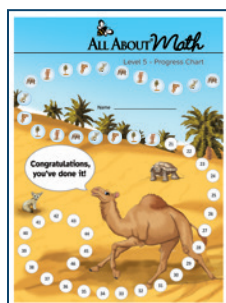
1. Cut apart the *Now Boarding* equation cards. Mix them up and place them in a stack, equation side down.
2. Cut apart the *Now Boarding* product cards and spread them out, number-side up. Discard the blank cards. Place the *Now Boarding* map in the dry-erase pocket.
3. The players will take turns choosing the top *Now Boarding* equation card to solve. Then, each student should use an algorithm to find the product. He will look at the *Now Boarding* product cards for the answer.
4. If his answer is correct, the destinations will match on both the equation and product cards. He can then write his initials next to the destination on the *Now Boarding* map.
5. If incorrect, he will place the equation card at the bottom of the stack and the product card back in the workspace.
6. The player who visits the most destinations after six rounds is the winner.

Cards A-L, AA-XX, and airplane product cards practice multiplying by one-digit numbers. Cards M-X and suitcase product cards practice multiplying by two-digit Numbers. Use one set or all depending on your student's needs.



Track Your Progress

Mark the Progress Chart



Have your student mark Lesson 20 on the Progress Chart.

Lesson 35 Show What You Know! 4: Patterns and the Coordinate Grid

Objective

The purpose of this lesson is to assess your student's academic growth and performance over time and to identify both areas of strength and areas needing improvement.

You Will Need

- Gallop into Math!* pages 271 to 278
- Grid Paper, *Calina's Math Tools*
- Decimal Place Value Chart, *Calina's Math Tools*
- Multiplication Table, *Calina's Math Tools* (optional)
- Large Grid Paper, *Calina's Math Tools*
- Analyzing Patterns Mat, *Calina's Math Tools*
- Classifying Shapes Cards, *Calina's Math Tools*
- Base-10 Blocks
- Table and Labeled Grid, *Calina's Math Tools*
- dry-erase board, pocket, and marker
- Finding Simplest Form Mat, *Calina's Math Tools* (optional)
- Table and Blank Grid, *Calina's Math Tools*
- Partial Quotient Division Mat, *Calina's Math Tools* (optional)
- Decimal Division and Multiplication, *Calina's Math Tools*

Before You Begin

Preview Lesson

It's time to do a review to help you monitor your student's progress and see what your student has retained versus what might still need some practice. Don't worry if your student struggles with any concepts; at the end of this lesson, a chart is provided that shows which lessons to review if needed.

Remember that math skills develop gradually as your student builds on what she has learned. Through regular practice, such as daily reviews, engaging activities, and *Calina's Math Fun!* games, your student will develop a stronger grasp of math, improving her skills step by step over time.

As with all the lessons, you do not have to complete the review in one sitting. Feel free to take breaks or to split this lesson over multiple days. Keep things light, and be sure to encourage your student along the way!

Progress Monitoring

“You worked really hard to learn about patterns and the coordinate grid. Now, we will do a review so you can show me what you learned. You can take as much time as you need to think about and solve the problems.”

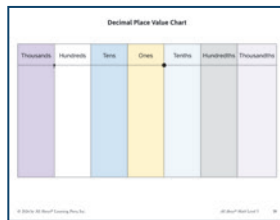
“Let’s show what you know!”



Show What You Know! 4

Turn to page 271 in the *Gallop into Math!* activity book for questions 1 to 5.

Question 1



Decimal Place Value Chart

Find the *Decimal Place Value Chart* from *Calina’s Math Tools*. Place it into the dry-erase pocket.

Write 1.84 and 1.329 on the dry-erase board. Leave a space between the numbers for your student to add the comparison symbol.

student to add the comparison symbol.

“Write the comparison symbol needed to make this statement true. Then, explain how you decided. Use the *Decimal Place Value Chart* to help you, if you’d like.” (*Answer: >*) *Since both numbers have the same number of wholes, I compared the digit in the tenths place. I know eight tenths is more than three tenths.*

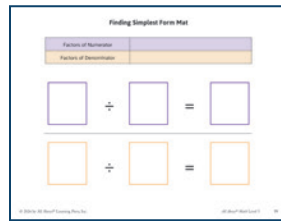
Clear the dry-erase board and write 4.509 and 4.513, leaving a space between the numbers. “Which symbol should we use to compare these two decimals?” (*Answer: <*)

“Round each of these decimals to the nearest hundredth. Then, decide how to compare the rounded values.” (*Answer: 4.51 and 4.51. They’re equal to each other.*)

Circle your observations in question number 1. Clear the dry-erase board.

**Progress
Monitoring**
(continued)

Question 2



Finding Simplest Form Mat

Find the *Finding Simplest Form Mat* from *Calina's Math Tools*. Place it in the dry-erase pocket.

Write the following equations on the dry-erase board.

“Find the sum or difference of the equations. Write your answer in the simplest form. You can use the *Finding Simplest Form Mat* to help you, if you would like.”

- $\frac{2}{3} + \frac{1}{12} = \underline{\hspace{1cm}}$ (Answer: $\frac{9}{12} = \frac{3}{4}$)
- $\frac{8}{10} - \frac{2}{5} = \underline{\hspace{1cm}}$ (Answer: $\frac{2}{5}$)

Clear the dry-erase board.



Lesson 35 - Story Problems and Situations

Turn to page 275 in the *Gallop into Math!* activity book. The story problems and situations throughout this lesson are listed here for your student to read aloud or follow along as you read. She can also use the page to underline pertinent numbers, the question that needs to be answered, or anything else she may find helpful.

“Solve the story problems, and then share your answer. Make sure to write your answers in the simplest form.”

Story problem #1: Tate and his family drive $5\frac{3}{8}$ miles to the park for the family reunion. His cousin’s family drives $1\frac{1}{2}$ miles less than Tate’s family to get to the park. How many miles did Tate’s cousin’s family drive to get to the park? (Answer: $3\frac{7}{8}$ miles)

Story problem #2: Tate and his sister are running a relay race at the reunion. Tate spent $4\frac{2}{6}$ minutes running his laps. After passing the baton to his sister, she ran another $4\frac{1}{3}$ minutes. How long did it take them to finish the race? (Answer: $8\frac{2}{3}$ minutes)

Circle your observations in question number 2.

Progress Monitoring
(continued)

Question 3

“We learned that division can be represented by a fraction, and a fraction can be written as a division expression. Use the *Lesson 35 - Story Problems and Situations* page for this question.”

Situation #3: Seven appetizers are split equally between four people.

“Write the division expression and the matching fraction represented by this situation.” (*Answer: $7 \div 4$ and $\frac{7}{4}$*)

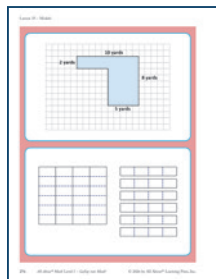
Story problem # 4: Tate and his sister made banana bread for the family reunion. They had 14 bananas and split them evenly between 6 loaves. How many bananas did they use in each loaf?

“Write and solve the equation that this problem represents. Make sure to simplify fractions and write improper fractions as mixed numbers.” (*Answer: $14 \div 6 = \frac{14}{6} = 2\frac{1}{3}$*)

Circle your observations in question number 3.

Question 4

Have the *Multiplication Table* available for your student to use throughout the lesson.



Lesson 35 - Models

Turn to page 276 in the *Gallop into Math!* activity book. You will use the model at the top of the page to answer this question.

“How can we find the two missing side lengths in this model?” *We can use the information given. For example, for the vertical piece that is missing, we will use the other two vertical pieces, eight and two. Its length has to be $8 - 2$, or six yards.*

“Right! Find the missing side lengths, and then use that information to help you find the perimeter of the shape.” (*Answer: Missing side lengths: 6 yards (vertical), 5 yards (horizontal), perimeter = 36 yards*)

“Now, find the area of the shape.” (*Answer: 50 square yards*)



Large Grid Paper

Find the *Large Grid Paper* from *Calina's Math Tools*. Place it into the dry-erase pocket.

Progress Monitoring

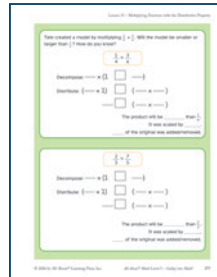
(continued)

“Next, let’s find the area of a rectangle with a length of four inches and a width of $\frac{2}{3}$ of an inch. Using what you know about the size of the factors, will the area be greater than or less than four square inches? How do you know?” *It will be less because $\frac{2}{3}$ is smaller than one whole.*

“You got it! Now, find the area of this rectangle. Use the *Large Grid Paper* to help you, if you’d like.” (*Answer: $\frac{8}{3}$ square in. = $2\frac{2}{3}$ square in.*)

Circle your observations in question number 4. Clear the dry-erase pocket.

Question 5



Multiplying Fractions with the Distributive Property

Turn to page 277 in the *Gallop into Math!* activity book.

“Use the distributive property to solve each problem. After solving, explain your reasoning. Then, use the distributive property to help you decide if the model is larger or smaller than the original, state the scale, and say how much of the original is added or removed.”

Answer Key

Tate created a model by multiplying $\frac{1}{4} \times \frac{3}{6}$. Will the model be smaller or larger than $\frac{1}{4}$? How do you know?

$\frac{1}{4} \times \frac{3}{6}$

Decompose: $\frac{1}{4} \times (1 \square \frac{2}{6})$

Distribute: $(\frac{1}{4} \times 1) \square (\frac{1}{4} \times \frac{2}{6})$

$\frac{1}{4} \square (\frac{1}{4} \times \frac{2}{6})$

The product will be **smaller** than $\frac{1}{4}$.

It was scaled by $\frac{3}{6}$ or $\frac{1}{2}$.

$\frac{1}{2}$ of the original was added/removed.

$\frac{2}{3} \times \frac{7}{5}$

Decompose: $\frac{2}{3} \times (1 \square \frac{2}{5})$

Distribute: $(\frac{2}{3} \times 1) \square (\frac{2}{3} \times \frac{2}{5})$

$\frac{2}{3} \square (\frac{2}{3} \times \frac{2}{5})$

The product will be **larger** than $\frac{2}{3}$.

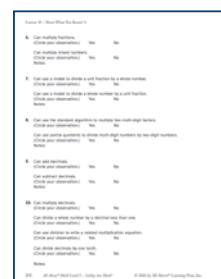
It was scaled by $\frac{7}{5}$.

$\frac{2}{5}$ of the original was added/removed.

Circle your observations in question number 5.

You can take a short break if needed.

Don't Forget!



Show What You Know! 4

Turn to page 272 in the *Gallop into Math!* activity book for questions 6 to 10.

Progress Monitoring
(continued)

Question 6

Write the following equations on the dry-erase board.

“Find the product to complete each equation. Use any strategy or math tool of your choice to help you.”

- $\frac{7}{8} \times \frac{3}{4} = \underline{\hspace{2cm}}$ (Answer: $\frac{21}{32}$)
- $4\frac{1}{3} \times 3\frac{3}{5} = \underline{\hspace{2cm}}$ (Answer: $\frac{234}{15}$ or $15\frac{9}{15}$ or $15\frac{3}{5}$)

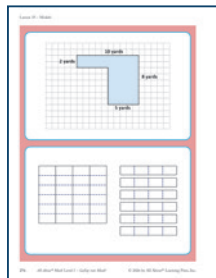
Clear the dry-erase board.

“Use the *Lesson 35 - Story Problems and Situations* page for the next part of the question. Solve the story problem.”

Story problem #5: The pavilion at the park was reserved for $3\frac{1}{4}$ hours for the reunion. If Tate’s family stayed for $\frac{5}{6}$ of the reserved time, how long were they at the pavilion? (Answer: $\frac{65}{24} = 2\frac{17}{24}$ hours)

Circle your observations in question number 6.

Question 7



Models

Turn to page 276 in the *Gallop into Math!* activity book. You will use the models at the bottom of the page to answer the question.

On the dry-erase board write the two expressions $\frac{1}{4} \div 6 = \underline{\hspace{2cm}}$ and $6 \div \frac{1}{4} = \underline{\hspace{2cm}}$.

“These models both represent division. One represents the expression $\frac{1}{4} \div 6$, and the other represents $6 \div \frac{1}{4}$. Which model represents each expression?”

Answer Key

 $\frac{1}{4} \div 6 = \underline{\hspace{2cm}}$	 $6 \div \frac{1}{4} = \underline{\hspace{2cm}}$
---	---

“Now, use the models to find the quotient of each equation.”
(Answers: $\frac{1}{4} \div 6 = \frac{1}{24}$ and $6 \div \frac{1}{4} = 24$.)

Progress Monitoring

(continued)

Circle your observations in question number 7. Clear the dry-erase board.

Question 8

Write $54 \times 673 = \underline{\hspace{2cm}}$ on the dry-erase board.

“Find the product of this equation by stacking the numbers. You can use the *Grid Paper*, if you’d like, to help keep your work organized.”
(Answer: $54 \times 673 = 36,342$)

Clear the dry-erase board and write $768 \div 24 = \underline{\hspace{2cm}}$.

“Find the quotient to this equation. You can use the *Partial Quotient Division Mat* to help you, if needed.” (Answer: 32)

Circle your observations in question number 8. Clear the dry-erase board.

Question 9



Solving Equations

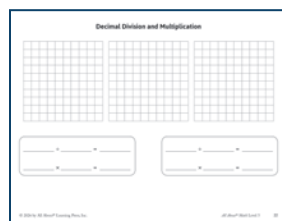
Turn to page 278 in the *Gallop into Math!* activity book. You will use the top part of the page for this question.

“Find the sum or difference of the following equations. You can use the base-10 blocks or the *Decimal Place Value Chart* to help, if you would like.”

- $2.873 + 5.342 = \underline{\hspace{2cm}}$ (Answer: 8.215)
- $6.2 + 5.48 = \underline{\hspace{2cm}}$ (Answer: 11.68)
- $10.091 - 4.592 = \underline{\hspace{2cm}}$ (Answer: 5.499)
- $7.41 - 4.9 = \underline{\hspace{2cm}}$ (Answer: 2.51)

Circle your observations in question number 9. Clear the dry-erase board.

Question 10



Decimal Division and Multiplication

Find *Decimal Division and Multiplication* in *Calina’s Math Tools*. Place the page into the dry-erase pocket.

Write the equations $4 \times 2.36 = \underline{\hspace{2cm}}$ and $0.7 \times 0.8 = \underline{\hspace{2cm}}$ on the dry erase board.

Progress Monitoring
(continued)

“Rewrite the following equations in stacked form and find the product. You can use the base-10 blocks or the grids on the *Decimal Division and Multiplication* math tool to help you.”

- $4 \times 2.36 = \underline{\hspace{2cm}}$ (Answer: 9.44)
- $0.7 \times 0.8 = \underline{\hspace{2cm}}$ (Answer: 0.56)

Fill in one of the blank division equations on *Decimal Division and Multiplication* so that it reads $2 \div 0.5 = \underline{\hspace{2cm}}$.


“Use the hundredths grids to find the quotient. Then, explain how you found your answer.” (Answers: 4) *I split two wholes into groups of 0.5. There are four groups.*

“Nice job! Now, write the related multiplication equation.”
(Answer: $4 \times 0.5 = 2$)

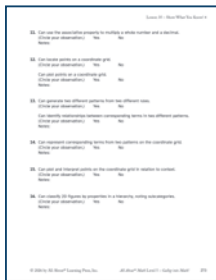
Clear the dry-erase pocket. Fill in one of the blank division equations on *Decimal Division and Multiplication* so that it reads $1.5 \div 0.1 = \underline{\hspace{2cm}}$.

“Use your understanding of place value and decimals to find the quotient. Then, explain how you know.” (Answer: $1.5 \div 0.1 = 15$) *There are 15 tenths in 1.5 because there are 10 tenths in one whole plus 5 more tenths. $\frac{15}{10} \div \frac{1}{10} = 15 \div 1$. So $1.5 \div 0.1 = 15$.*

Circle your observations in question number 10. Clear the dry-erase board and pocket.



You can take a short break if needed.



Show What You Know! 4

Turn to page 273 in the *Gallop into Math!* activity book for questions 11 to 16.

Progress Monitoring

(continued)

Question 11



Solving Equations

Turn to page 278 in the *Gallop into Math!* activity book. You will use the bottom part of the page for this question.

“We can use the associative property to help us multiply a whole number and a decimal. Look at each of the three equations. Some are true, and

some are false.”

“Let’s look at the first equation. Circle whether it is true or false. How do you know?” *It’s true because the decimal 0.2 is the same as 2×0.1 .*

“Good. Is the second equation true or false? Circle your answer then explain how you know.” *It’s false because $6 \times 0.1 = 0.6$, not 0.06 .*

“Right. How could you correct this equation?” *You can change the 0.1 to 0.01.*

“That’s right. Now look at the last equation. Circle if it is true or false. How did you decide?” *It’s true. Three groups of 0.01 are equal to 0.03.*

Circle your observations in question number 11.

Question 12

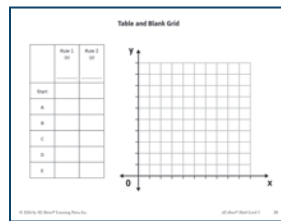
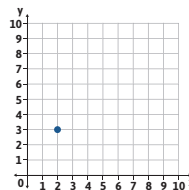


Table and Blank Grid

Find the *Table and Blank Grid* from *Calina’s Math Tools*. Place it into the dry-erase pocket. Label each axis from zero to ten.

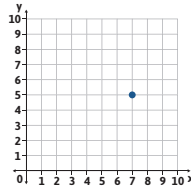
Draw a point on the coordinate grid at the coordinates (2, 3).



“Write the coordinates of this point beside it on the dry-erase pocket.” (*Answer: (2, 3)*)

Progress Monitoring
(continued)

Clear the dry-erase pocket. Draw a point at coordinates (7, 5).



“Sadie says the location of this point is five, seven (write (5, 7) on the dry-erase board). Do you agree with Sadie? If not, what mistake do you think she might have made?” *I disagree with Sadie. She mixed up the order of the points. This point is located at (7, 5).*

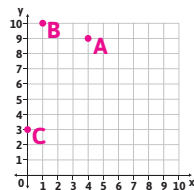
Clear the dry-erase pocket. Write the following points on the dry-erase board.

- Point A: (4, 9)
- Point B: (1, 10)
- Point C: (0, 3)

“Help Sadie plot a few points on the coordinate grid.”

“Choose one of your points and pretend to explain to Sadie how you decided where to place it on the coordinate grid.” Answers will vary based on which point your student decides to share. Example: For point A, I counted four spaces over on the horizontal axis and then counted up nine spaces up on the vertical axis.

Answer Key



Circle your observations in question number 12. Clear the dry-erase board and pocket.

Question 13

Analyzing Patterns Mat	
Pattern 1	
Start	Rule
0	_____
Pattern 2	
Start	Rule
0	_____

Analyzing Patterns Mat

Find the *Analyzing Patterns Mat* from *Calina’s Math Tools*. Place it into the dry-erase pocket. In the Rule box for Pattern 1, write + 3. In the Rule box for Pattern 2, write + 9.

**Progress
Monitoring**
(continued)

“Follow the rules to generate the first six terms of each pattern. Fill in the blanks on the *Analyzing Patterns Mat*.” (Answers: Pattern 1 – 3, 6, 9, 12, 15, 18; Pattern 2 – 9, 18, 27, 36, 45, 54)

“What is the relationship between the corresponding terms in these patterns?” *The numbers in Pattern 2 are three times larger than the corresponding numbers in Pattern 1.*

“That’s right! Use this relationship to help you determine what number Pattern 2 will display when Pattern 1 displays 36.” (Answer: 108)

Clear the dry-erase pocket. Write + 2 as the rule for Pattern 1. Write + 5 as the rule for Pattern 2.

“Follow the rules to complete each pattern. Fill in the blanks on the *Analyzing Patterns Mat*.” (Answers: Pattern 1 – 2, 4, 6, 8, 10, 12; Pattern 2 – 5, 10, 15, 20, 25, 30)

Write the following equations on the dry-erase board:

- $6 \times \frac{5}{2} = 15$
- $2 \times \frac{5}{2} = 5$
- $8 \times \frac{5}{2} = 25$

“Circle the two equations that can be used to show the relationship between the corresponding terms in these patterns. How did you decide?” (Answer: $6 \times \frac{5}{2} = 15$ and $2 \times \frac{5}{2} = 5$) *The other equation, $8 \times \frac{5}{2} = 25$, does not show the correct product; also 8 and 25 are not corresponding terms, making the equation not true.*

“Using this relationship, what number will Pattern 2 display when Pattern 1 displays the number 40? Write an equation to help you find the answer.” (Answers: 100, $40 \times \frac{5}{2} = 100$)

Circle your observations in question number 13. Clear the dry-erase board and pocket.

Question 14

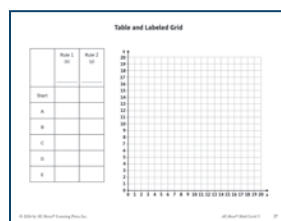


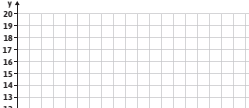
Table and Labeled Grid

Find the *Table and Labeled Grid* in *Calina’s Math Tools*. Place it into the dry-erase pocket.

Progress Monitoring
(continued)

Write +1 for Rule 1(x) and +3 for Rule 2(y). Write 0 for the starting point for each rule.

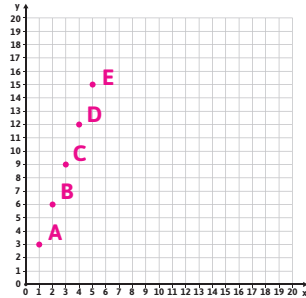
	Rule 1 (x)	Rule 2 (y)
	+1	+3
Start	0	0
A		



“Using the rules, write the first five numbers of each pattern.”
(Answer: 1, 2, 3, 4, 5 and 3, 6, 9, 12, 15)

“Good. Now, use the patterns to plot each point A through E on the coordinate grid.”

Answer Key



“Looking at your work, what is the ordered pair for point E?”
(Answer: (5, 15))

Clear the points on the grid and the numbers in the table for Rule 1 (x). Leave the numbers forming the pattern for Rule 2 (y).

“Let’s change one of the rules and see how that affects our ordered pairs and coordinate grid.” Write +2 for Rule 1 (x) and keep the starting point at 0.

“Fill in the boxes with the first terms in this pattern.” (Answer: 2, 4, 6, 8, 10)

“Following these two patterns, what is the ordered pair for Point E?”
(Answer: (10, 15))

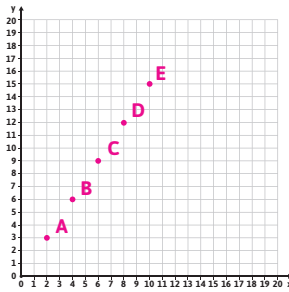
“What is the relationship between the numbers in Rule 1 and the numbers in Rule 2?” *The terms in Rule 2 are $\frac{3}{2}$ of the terms in Rule 1.*

“Good. Now, plot the ordered pairs on the coordinate grid.”

Progress Monitoring

(continued)

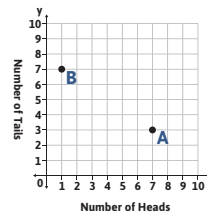
Answer Key



Circle your observations in question number 14. Clear the dry-erase pocket.

Question 15

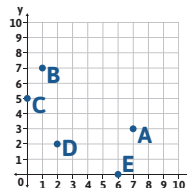
Place the *Table and Blank Grid* back into the dry-erase pocket. Prepare the coordinate grid by labeling the x-axis with the Number of Heads and the y-axis with the Number of Tails. Number both axes from zero to ten. Plot a point at (7, 3) and label it *A*. Plot an additional point at (1, 7) and label it *B*.



“This coordinate grid represents the results of flipping a coin. Jessica flipped a coin eight times. The coin landed on tails seven of the eight times. Which ordered pair on the coordinate grid represents Jessica’s results? How do you know?” *The ordered pair (1, 7) shows her results. The seven is plotted on the y-axis because it represents the number of tails. Point A shows she flipped the coin ten times, while Point B shows she flipped it eight times in total.*

“Reid’s results from flipping the coin are represented at Point *A*. What can you tell me about Reid’s results?” *Reid flipped the coin ten times. He got seven heads and three tails.*

Add three additional points on the coordinate grid. Point *C* at (0, 5), Point *D* at (2, 2), and Point *E* at (6, 0).



Progress Monitoring

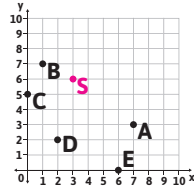
(continued)

“Three more people listed their results from flipping a coin. Which point represents the person who did not get any heads?” *Point C.*

“Which point represents the person who flipped heads and tails an equal number of times?” *Point D.*

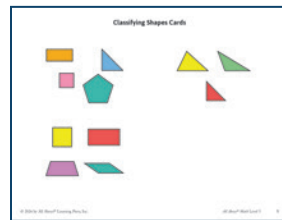
“Sarah flipped a coin nine times. She got heads three times. Plot a point labeled *S* on the coordinate grid to represent Sarah’s results. What is the ordered pair at this point?” (*Answer: (3, 6)*)

Answer Key



Circle your observations in question number 15.

Question 16



Classifying Shapes Cards

Find the *Classifying Shapes Cards* from *Calina’s Math Tools*. Place the cards in a stack in front of your student.

“We’ve learned how to classify shapes based on their properties to see which shapes share properties with other shapes and the unique properties that shapes have.”

Place the following cards in front of your student: square, rectangle, parallelogram, and trapezoid.

“Three of these shapes share properties, and one is the odd one out. Which shape is the odd one out, and what is the shared property amongst the other three cards? How did you know?” *The odd one out is the trapezoid. The shared property is having two pairs of parallel sides, which the square, rectangle, and parallelogram all have. The trapezoid does not because it only has one pair of parallel sides.*

Circle your observations in question number 16.

Progress Monitoring

(continued)

Math Reflection

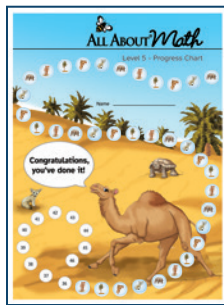
“Let’s reflect!”

Ask your student the following questions:

- “What would you like more practice with?”
- “What is your favorite topic to practice?”

Track Your Progress

Mark the Progress Chart



Have your student mark Lesson 35 on the Progress Chart.

Skill Chart

This section is just for the parent.

Take a look at your student’s progress, and think about the areas where your student could use extra practice building her skills. This review is a great time to update your student’s progress on her *Daily Review Tracker*.

Refer to any lesson below that may require more practice.

Taking time to review the questions your student found difficult can help identify any patterns or areas where she might need extra help. Going over these challenging questions again gives her a chance to practice these skills.



Question 1: Comparing and rounding decimals	Lessons 4 and 5
Question 2: Adding and subtracting fractions	Lessons 6 and 7
Question 3: Division with fractions	Lessons 8 and 9

Skill Chart

(continued)

Question 4: Finding perimeter and area	Lessons 11 and 12
Question 5: Interpreting multiplication as scaling	Lessons 14 and 15
Question 6: Multiplying fractions	Lesson 16
Question 7: Dividing with unit fractions	Lessons 17 and 18
Question 8: Using an algorithm to multiply and a partial quotient to divide multi-digit numbers	Lessons 20 and 21
Question 9: Adding and subtracting with decimals	Lesson 22
Question 10: Multiplying and dividing with decimals	Lessons 23, 24, and 25
Question 11: Multiplying whole numbers and decimals	Lesson 27
Question 12: Naming and plotting points on a coordinate grid	Lessons 28 and 29
Question 13: Generating and interpreting patterns	Lessons 30 and 31
Question 14: Creating and representing ordered pairs	Lessons 32 and 33
Question 15: Plotting and interpreting points	Lesson 34
Question 16: Classifying shapes	Lessons 3 and 4

Your student will continue to practice and build these skills through the daily reviews and within the lessons. However, if your student had difficulty answering two or more questions, spend a few days reviewing the material before proceeding.

Lesson 43

Creating and Interpreting Dot Plots

Objective

Your student will learn to represent and interpret frequency data using a dot plot.

You Will Need

- Gallop into Math!* pages 345 to 348
- Bar Graph Template, *Calina's Math Tools*
- dry-erase board, pocket, and marker
- Dot Plot/Line Plot Template, *Calina's Math Tools*, page 32
- Two-Color Counters (optional)

Math Vocabulary

dot plot

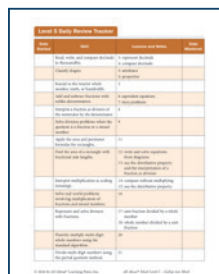
Before You Begin

Preview Dot Plots

In this lesson, your student will continue to represent and interpret data. Previously, she explored using a bar graph to model categorical data. Now, she will be introduced to a dot plot to graph frequency data. A **dot plot** is created by using a number line, with each piece of data shown by placing a dot above its value on the line. It helps to visually organize data for easy comparison and analysis. Your student will be given a dataset and will label the number line appropriately while plotting the points to represent each piece of data. She will then analyze her dot plot to answer questions about the data.

The dot plots created in this lesson will have a scale using whole numbers. In future lessons, your student will explore how to represent fractional data in a similar graph.

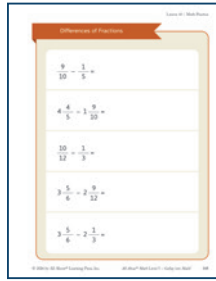
Review



Daily Review

As part of your math time each day, refer to your student's *Daily Review Tracker*. Choose one or two skills, and take a few minutes to practice.

Review (continued)



Math Practice

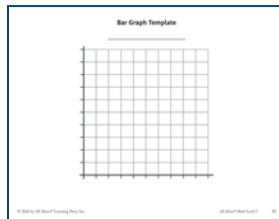
Turn to page 345 in the *Gallop into Math!* activity book.

“Let’s review finding the difference of fractions. Solve each equation by finding the difference. Remember to simplify your answer.”

Answer Key

- $\frac{9}{10} - \frac{1}{5} = \frac{7}{10}$
- $4\frac{4}{5} - 1\frac{9}{10} = 2\frac{9}{10}$
- $\frac{10}{12} - \frac{1}{3} = \frac{6}{12} = \frac{1}{2}$
- $3\frac{5}{6} - 2\frac{9}{12} = 1\frac{1}{12}$
- $3\frac{5}{6} - 2\frac{1}{3} = 1\frac{3}{6} = 1\frac{1}{2}$

Bar Graphs



Bar Graph Template

Find the *Bar Graph Template* from *Calina’s Math Tools*. Place the page into the dry-erase pocket.



Lesson 43 - Datasets

Turn to page 346 in the *Gallop into Math!* activity book. The datasets throughout this lesson are listed here for your student to reference while making each graph.

“Previously, we learned how to represent and organize data using a bar graph. Look at the dataset titled Review.”

Review: An ice cream parlor asked customers to vote on their favorite ice cream flavor.

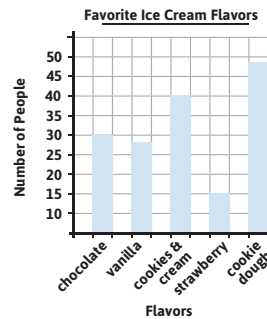
“What do you need to include before representing the data on the bar graph?” *The title, labels for the axes, and a scale.*

“Good. Include these aspects on the *Bar Graph Template*. Then, tell me about your choices.” Allow your student to share her labels and

Review (continued)

reasoning for the title, axes, and scale. Check that the scale lists the multiples of the number she chose.

“Now, use the data to make your bar graph.” Your student might choose to use a different scale to label the y-axis and to switch the axes, making the bars horizontal instead of vertical.



“Great work. Which two ice cream flavors received the most votes?”
Cookie dough and cookies and cream had the most.

“Right. Which flavors received more than 25 votes?” *All the flavors except for strawberry.*

“When making ice cream for the day, do you think the ice cream parlor should make more vanilla or strawberry ice cream? Why?” *Probably more vanilla because more people like that flavor.*

“Good. We can represent data using other types of graphs, too.” Clear the dry-erase pocket.

New Teaching

Creating and Interpreting Dot Plots

“Let’s imagine our family opened a donut shop. We have been collecting data about the donuts we’ve made and sold and the hours our employees have worked at the shop.”

“Let’s look at Dataset #1. This data shows the number of donuts each customer purchased this morning. We will use a dot plot to organize the data. A **dot plot** uses a number line and dots to show how often or how frequently each individual number is used, like how many customer visits there were, how many inches a donut is, or how many hours someone worked. A bar graph is for categories, like favorite ice cream flavors, and shows how many are in each group.”

New Teaching (continued)



Dot Plot/Line Plot Template

Find the *Dot Plot/Line Plot Template* from *Calina's Math Tools*, page 32. Place the page into the dry-erase pocket.

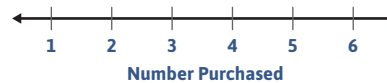
“What do you notice or wonder about the template for a dot plot?” *It has a number line. There's no grid. I wonder where the dots go. I wonder what numbers we'll use.*

“Just like bar graphs have titles, it's important to title a dot plot, too. What would be a good title for this graph? Write it on the top line of the *Dot Plot/Line Plot Template*.” Answers may vary. Example: Donuts Purchased by Customers this Morning.

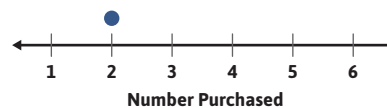
“Good. Our dot plot has a number line at the bottom. We'll look at the numbers in our dataset to determine how to label the number line. When we look at the dataset (point to Dataset #1), what is the smallest and largest number you see?” *The smallest number is one, and the largest is six.*

“Yes. So, we need to label our number line from one to six. (Add tick marks and the numbers to the template.) We will also label the number line so that anyone looking at our dot plot can understand what it represents. Since the numbers tell us the number of donuts purchased, we can label the line 'Number Purchased'.”

Donuts Purchased by Customers This Morning



“Now, we can add our dots to the dot plot. Each time we see a number in our dataset, we'll place a dot above the same number on the number line. The first number in our dataset is two. So, I'll place a dot above the two.”

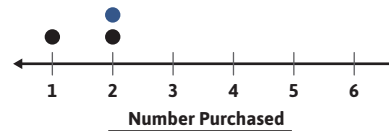


“Next, there's a one in our dataset. Place a dot above the one on the number line. The dots on the dot plot should be evenly spaced and line up horizontally so that it is easy to see how many dots there are above each number.”

New Teaching (continued)

“Good. Where should we place the next dot from our dataset?” *Above the two.*

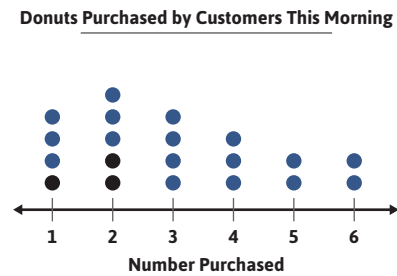
“Right. Place a dot above the two we already plotted.”



Cross out each number after it is plotted. This can reduce the chance of plotting the same data twice or missing a specific data point.



“Complete the dot plot by placing a dot to represent each number in our dataset.”



“Great. Our data is now organized in a way that helps us easily see the number of customers that bought one donut, two donuts, three, four, five, or six donuts. How many customers purchased one donut?” *Four.*

“Yes. How many customers purchased five donuts?” *Two.*

“Right. I notice that the number of dots above the two looks like the most. How many customers purchased two donuts this morning?” *Five.*

“Yes. Did more customers purchase six donuts or three donuts? How do you know?” *More customers purchased three donuts because there are four dots above three and only two above six.*

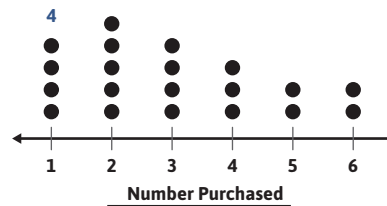
“Right. How many customers in total purchased one or more donuts this morning?” *Twenty.*

“Yes. We can also figure out the total number of donuts sold this morning by adding up the values of each dot. Each dot above the one represents one donut. So, there are four donuts.” Write 4 above the dots in the one column.

New Teaching

(continued)

Donuts Purchased by Customers This Morning



“Now, let’s look at the column representing two donuts. Remember, each dot represents a person buying two donuts. So, to figure out the total number of donuts, we can count by twos.” Count by twos as you point to each dot above the two column.

“There are 10 donuts. Write ten above this column.”

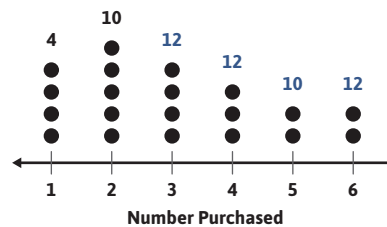
“How can we find the number of donuts sold in the column showing three and what is the total?” *We can count by threes. The total is twelve.*

If your student says we can count the number of dots, remind her that the dot represents a person. Since the dot is listed above three, that means each dot tells us that each person purchased three donuts.



“Yes. Continue counting to find the total number of donuts sold. You can write the total for each column to help you keep track.”

Donuts Purchased by Customers This Morning



“Now, to find the total number of donuts we sold, we can add up all the totals. How many donuts were sold this morning?” *Sixty donuts.*

“You got it. Let’s organize another set of data using a dot plot.” Clear the dry-erase pocket.

“Dataset #2 lists the number of hours our employees each worked last week. Let’s make a dot plot to display the data. Write a title at the top of the *Dot Plot/Line Plot Template*.” Answers may vary.

“Now, let’s add the tick marks to our number line. What are the smallest and largest numbers in the dataset?” *The smallest is 20 and the largest is 40.*

New Teaching (continued)

“Right. Do you think we should count by ones or by another number?”
Another number.

If needed, help your student see that counting by fives is a good choice. Support your student as needed to label the number line.

“What do the numbers on the number line represent?” *The number of hours the employees work.*

“Right. So, a good label might be ‘Hours’. Label the number line.”

“Now, add the dots to your dot plot.”



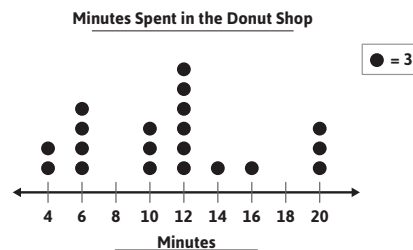
“Nice work. Did any employees work less than 20 hours? How do you know?” *No, there are no data points less than 20.*

“Right. How many employees worked 30 hours last week? How do you know?” *Zero because there are no dots above 30.*

“Correct. Most employees worked how many hours?” *Twenty hours.*

“Good. How many employees worked at the donut shop last week? How did you figure this out?” *Twelve employees worked last week. I counted the total number of dots.*

Clear the dry-erase pocket. Create the dot plot shown in the image.



“This dot plot was created to represent the amount of time that customers spent in the donut shop. The dots on this dot plot each represent a value of more than one (point to the box that shows one dot equals three). Sometimes, a key will be added to show the value of each dot. In this graph, each dot represents three, or three people.”

New Teaching

(continued)

“When we look at the number of customers that spent six minutes in the donut shop, we’ll still count the number of dots, but this time, each dot will represent three. How many customers spent six minutes in the shop?” *Twelve.*

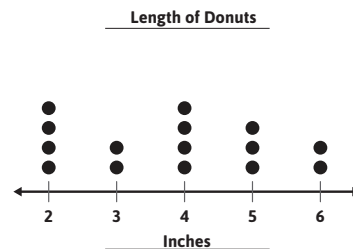
“How many customers spent 14 or more minutes in the donut shop? How did you decide?” *Fifteen customers. There are five dots shown, one on fourteen, one on sixteen, and three on twenty. Five times three equals fifteen.*

“How many customers spent ten minutes or less in the donut shop?” *Twenty-seven customers.*

Clear the dry-erase pocket. “How is a dot plot similar to a bar graph, and how is it different?” *Like a bar graph, a dot plot has a title and groups data together. It looks different because there is no y-axis. It uses a number line.*

“How does a dot plot help you understand the data more easily?” *Instead of a list of numbers, a dot plot sorts the data so that you can easily find totals and make comparisons.*

“Let’s look at Dataset #3. Each number in this dataset represents the length, in inches, of the donuts available to purchase. Use the data to make a dot plot.”

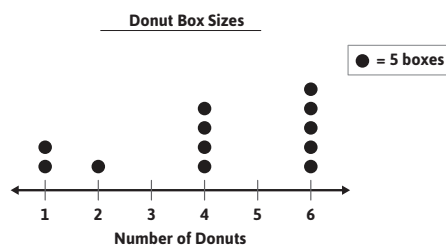


“How many donuts are three inches or shorter?” *Six.*

“What is the longest length of all the donuts?” *Six inches.*

“What is the total length of all the donuts combined? Add each measurement together to find out.” *57 inches.*

Clear the dry-erase pocket. Create the dot plot shown in the image.



New Teaching (continued)

“This dot plot shows the number of boxes we have that will hold different amounts of donuts. What does the key tell us about this graph?” *Each dot represents five boxes.*

“Right. How many boxes are there that will hold four donuts?” *Twenty.*

“How many boxes are there that will hold fewer than three donuts?” *Fifteen.*

Complete Activity Sheet

“Let’s practice representing and interpreting data on a dot plot.”



Delicious Donuts

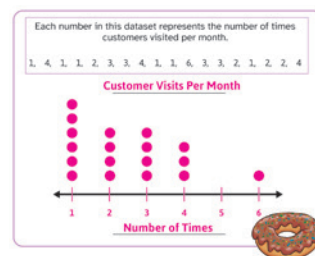
Turn to pages 347 and 348 in the *Gallop into Math!* activity book.

“Use the dataset to make a dot plot representing the number of times customers visited the donut

shop per month. Then, use the dot plot to answer the questions. On the back, decide if you agree or disagree with each statement based on the dot plot provided.” Ask your student to explain her thinking.

Answer Key

(page 347)



- 12 customers
- 4 customers
- 18 customers

(page 348)

- Disagree, Eight customers purchased five items because each dot represents two people.
- Disagree, Eight people purchased one donut. The three on the number line represents the number of donuts.



Look For

Your student might forget a dot or add an extra one when placing them above the number line. She might also get confused about what the dots represent when answering the questions.

Here’s How to Help: Have her cross off each number in the dataset as she adds a dot on the dot plot. If she gets confused about what the dots represent, review the title, label, key, and its meaning.

New Teaching (continued)

Math Reflection

“Let’s reflect!”

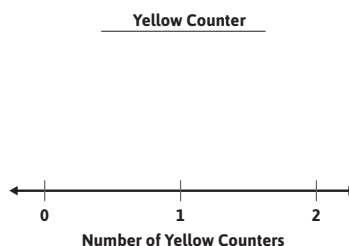
Ask some questions to guide your student’s reflection:

- “Why is it important to look for a key when interpreting data on a dot plot?”
- “How would you explain to a friend how to make a dot plot?”

Extended Practice (optional)

If your student cannot create and interpret a dot plot, or if she expresses the need for more practice, continue working on this skill.

Prepare the *Dot Plot/Line Plot* template as shown in the image.



You and your student will each flip a two-color counter two times for each round. Keep track of the number of times each person’s counter lands on the yellow side per round. Add a dot, or place a counter, to create a dot plot representing the total. For example, if you and your student both flip yellow one time during the first round, put two dots above one. Repeat the steps five times for a total of ten dots on the dot plot.

- “How many times did we get zero yellow counters?”
- “How many times did we get two yellow counters?”
- “Which number of yellow counters was most common?”

Repeat this process for more practice.

Your student will continue practicing with dot plots in future lessons. You can proceed to the next lesson without full mastery of the skill.

More or Less

“Let’s practice our math skills!”

Materials

- More or Less Dot Plots, *Gallop into Math!* pages 349 and 350
- More or Less Question List, *Gallop into Math!* page 351
- Dot Plot/Line Plot Template, *Calina's Math Tools*
- dry-erase board, pocket, and marker

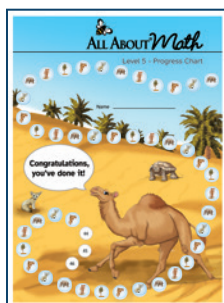
Directions

1. Cut apart the *More or Less* dot plots. Give one to each player. Start with the dot plots labeled A, or choose version B for a challenge. Players will keep their dot plot hidden from the other player during the game.
2. One at a time, the players will take turns trying to recreate the partner’s *More or Less* dot plot using the *Dot Plot/Line Plot Template*.
3. Place the *Dot Plot/Line Plot Template* in the dry-erase pocket. Label the *Dot Plot/Line Plot Template* with tick marks showing 1 to 3 for *More or Less* Dot Plots A or 1 to 4 for version B. Label the number line, “Donuts,” and write the title, “Donuts Purchased per Customer.” Each dot will represent one customer.
4. The player will ask yes or no questions that use the term “more or less” to help her determine the data shown in her partner’s *More or Less* dot plot. She can use the *More or Less* question list for support or ask her own questions. The player will keep track of the number of questions she asks by adding tallies to the dry-erase board.
5. As the player gathers information, she can take notes and add dots to the *Dot Plot/Line Plot Template*.
6. When a player believes she has correctly recreated the partner’s *More or Less* dot plot, she will ask the partner to check her work. If it is not correct, the partner will point out one mistake. The player will then continue asking questions until the dot plot is recreated correctly.
7. The player who creates her partner’s dot plot with the fewest questions is the winner.



Track Your Progress

Mark the Progress Chart



Have your student mark Lesson 43 on the Progress Chart.

APPENDIX A

Scope and Sequence of Level 5

Your Student Will:	Lesson
Review skills and concepts that involve multiplying and dividing numbers within 10,000; and geometry.	1
Review skills and concepts involving fractions and decimals.	2
Learn to read, write, and represent decimals to the thousandths place and classify shapes using attributes.	3
Learn to compare decimals to the thousandths place using comparison symbols and classify shapes using properties.	4
Learn to round decimals to the nearest whole, tenth, and hundredth.	5
Learn to find equivalent fractions to add and subtract fractions with unlike denominators.	6
Learn to solve problems involving adding and subtracting mixed numbers with unlike denominators.	7
Learn to represent the relationship between division and fractions.	8
Learn to solve division problems in which the quotient is expressed as a fraction or a mixed number.	9
Review all concepts learned in Lessons 3 – 9.	10
Learn to find the area and perimeter of rectangles.	11
Learn to find the area of a rectangle with fractional side lengths.	12
Learn to use different methods to find the area of a rectangle.	13
Learn to compare the size of a product to the size of one factor based on the size of the other factor.	14
Use the distributive property to reason about how much larger or smaller the scaling is when multiplied by a fraction greater than or less than 1.	15

Your Student Will:	Lesson
Learn to multiply fractions by fractions and mixed numbers.	16
Divide a unit fraction by a whole number to solve story problems.	17
Represent and divide a whole number by a unit fraction.	18
Review all concepts learned in Lessons 11 – 18.	19
Learn to use the standard algorithm to multiply multi-digit numbers.	20
Learn to divide multi-digit numbers by two-digit numbers.	21
Learn to add and subtract decimals.	22
Use place value understanding to find multi-digit decimal products.	23
Learn to divide a whole number by a decimal less than one.	24
Learn to divide decimals by decimals.	25
Review all concepts learned in Lessons 20 – 25.	26
Learn to multiply a whole number and a decimal using the associative property and an understanding of place value.	27
Build familiarity with the structure of a coordinate grid and learn to locate and describe points.	28
Learn to plot points on the coordinate grid and recognize the importance of being precise when naming coordinates.	29
Learn to generate patterns with different rules and identify the relationships between them.	30
Learn to generate two different patterns, given two different rules, and write equations to represent the relationship between corresponding terms.	31
Learn to represent corresponding terms for two patterns on the coordinate grid.	32
Learn to represent two patterns involving fractions on the coordinate grid.	33
Learn to represent situations by plotting and interpreting points on the coordinate grid.	34

Your Student Will:	Lesson
Review all concepts learned in Lessons 27 – 34.	35
Explore volume and the number of unit cubes that fill a space.	36
Learn to find the volume of a rectangular prism by looking at its layers and writing equations that include all three dimensions.	37
Learn to solve story problems involving cubic units of measure.	38
Learn to find the volume of irregular figures and write expressions to represent the total volume.	39
Write, interpret, and evaluate numerical expressions that represent the volume of solid figures composed of two right rectangular prisms.	40
Convert measurements using the power of 10 within a given system of measurement.	41
Learn to represent and interpret data using a bar graph with a scaled key.	42
Learn to represent and interpret frequency data using a dot plot.	43
Learn to represent and interpret measurement data using a line plot with fractional points.	44
Learn to solve multi-operational problems using a variety of graphs.	45
Review all concepts learned in Lessons 3 – 45.	46

APPENDIX C

Guidelines for Using Manipulatives and Drawings

Manipulatives and drawings are essential tools for building a strong foundational understanding of math concepts, such as addition, subtraction, multiplication, and division. These tools help children develop abstract thinking skills and concretely understand what operations mean (e.g., counting objects to understand addition). It is important to allow students to use manipulatives and drawings as long as they find them helpful or beneficial.

- **Children learn best by engaging with learning through multiple senses**, using sight, sound, and touch. Kinesthetic learning, meaning learning by touch, allows students to physically interact with the materials. Manipulatives provide a tangible way for learners to interact with mathematical concepts, allowing them to internalize ideas through hands-on exploration. Visual learning is engaged through drawings and diagrams, providing an essential understanding of relationships between numbers, geometric shapes, and patterns. Being able to draw helps learners organize information more effectively.
- **Manipulatives and drawings are powerful tools for reinforcing concepts over time.** By continuing to use them, children can deepen their understanding and retain knowledge better than if they were forced to rely solely on abstract methods.
- **When children continue to use physical tools to explore math, they develop a deeper,** more lasting understanding of why math works the way it does, instead of just memorizing procedures. This understanding is crucial for applying math in real-world situations.
- **Manipulatives and drawings can help make the learning process more enjoyable,** engaging, and hands-on. By encouraging students to use these tools as long as they find them helpful, educators can keep math fun and interesting, which is crucial for fostering a positive attitude toward the subject.
- **Manipulatives and drawings provide scaffolding for students who need more support.** They allow students to progress at their own pace, providing them with a way to fully engage with the material. The goal is to ensure that children are equipped with the support they need at every level of their learning and not to limit or rush their use of these tools.

As students become more confident in their ability to perform basic calculations, they can begin to rely less on manipulatives and drawings and start to use more mental math and number-based strategies. However, the exact timing for this transition can vary depending on the child's age and developmental stage, the complexity of the mathematical ideas involved, and the student's level of comfort. In general, students should stop using manipulatives and drawings for basic operations when they have developed fluency and can understand the underlying concepts abstractly. This typically occurs around late elementary or early middle school, but the exact timing can vary. (And for more advanced mathematics, research has shown that manipulatives improve learning for teens and even adults in subjects such as algebra and calculus.) The goal is for them to develop the ability

to think and reason abstractly, while still recognizing that manipulatives and drawings can be useful in more complex or unfamiliar contexts. It is important that the student make the decision about when to stop using manipulatives and drawings based on their individual level of comfort with the mathematical concepts involved.

If students do not want to use manipulatives or drawings when the lesson instruction directs them to use these methods, have them demonstrate their understanding of the method by solving 2–3 examples. Then, allow students to solve the remaining examples using the method of their choice. Students will use many of the same methods in higher mathematics to represent increasingly difficult concepts, so it is important that students understand and can apply different manipulatives and drawings to solve problems. However, this must be balanced with preventing students from becoming frustrated by having to use manipulatives and drawings when they can fluently solve problems using mental math and other strategies.

APPENDIX G

Units of Measurement Glossary



Centimeter (cm)

- 100 centimeters = 1 meter
- 1 centimeter = 10 millimeters



Cup (c)

- 1 cup = 16 tablespoons
- 2 cups = 1 pint



Fluid Ounces (fl oz)

- 8 ounces = 1 cup



Foot (ft)

- 1 foot = 12 inches
- 3 feet = 1 yard



Gallon (gal)

- 1 gallon = 4 quarts
- 1 gallon = 2 half gallons



Gram (g)

- 1 gram = 1,000 milligrams
- 1,000 grams = 1 kilogram



Inch (in)

- 12 inches = 1 foot

- Kilo _____
- Centi _____
- Milli _____

Kilo, Centi, Milli

- Kilo: 1,000 times. For example, a kilometer = 1,000 meters.
- Centi: 1/100. For example, a centimeter = 1/100 of a meter.
- Milli: 1/1000. For example, a millimeter = 1/1000 of a meter.



Kilogram (kg)

- 1 kilogram = 1,000 grams



Kilometer (km)

- 1 kilometer = 1,000 meters



Liter (L)

- 1 liter = 1,000 milliliters



Meter (m)

- 1 meter = 100 centimeters
- 1 meter = 1,000 millimeters
- 1,000 meters = 1 kilometer



Mile (mi)

- 1 mile = 5,280 feet



Milligram (mg)

- 1,000 milligrams = 1 gram



Milliliter (ml)

- 1,000 milliliter = 1 liter



Millimeter (mm)

- 1,000 millimeters = 1 meter
- 10 millimeters = 1 centimeter



Ounce (oz)

- 16 ounces = 1 pound



Pint (pt)

- 1 pint = 2 cups
- 2 pints = 1 quart



pound (lb)

- 1 pound = 16 ounces



Quart (qt)

- 1 quart = 2 pints
- 4 quarts = 1 gallon



Tablespoon (Tbsp)

- 1 tablespoon = 3 teaspoons
- 16 tablespoons = 1 cup
- 4 tablespoons = $\frac{1}{4}$ cup



Teaspoon (tsp)

- 3 teaspoons = 1 tablespoon



Yard (yd)

- 1 yard = 3 feet