



ALL ABOUT[®] Math

The program that takes the struggle out of math

Level 4 Teacher's Manual Sample

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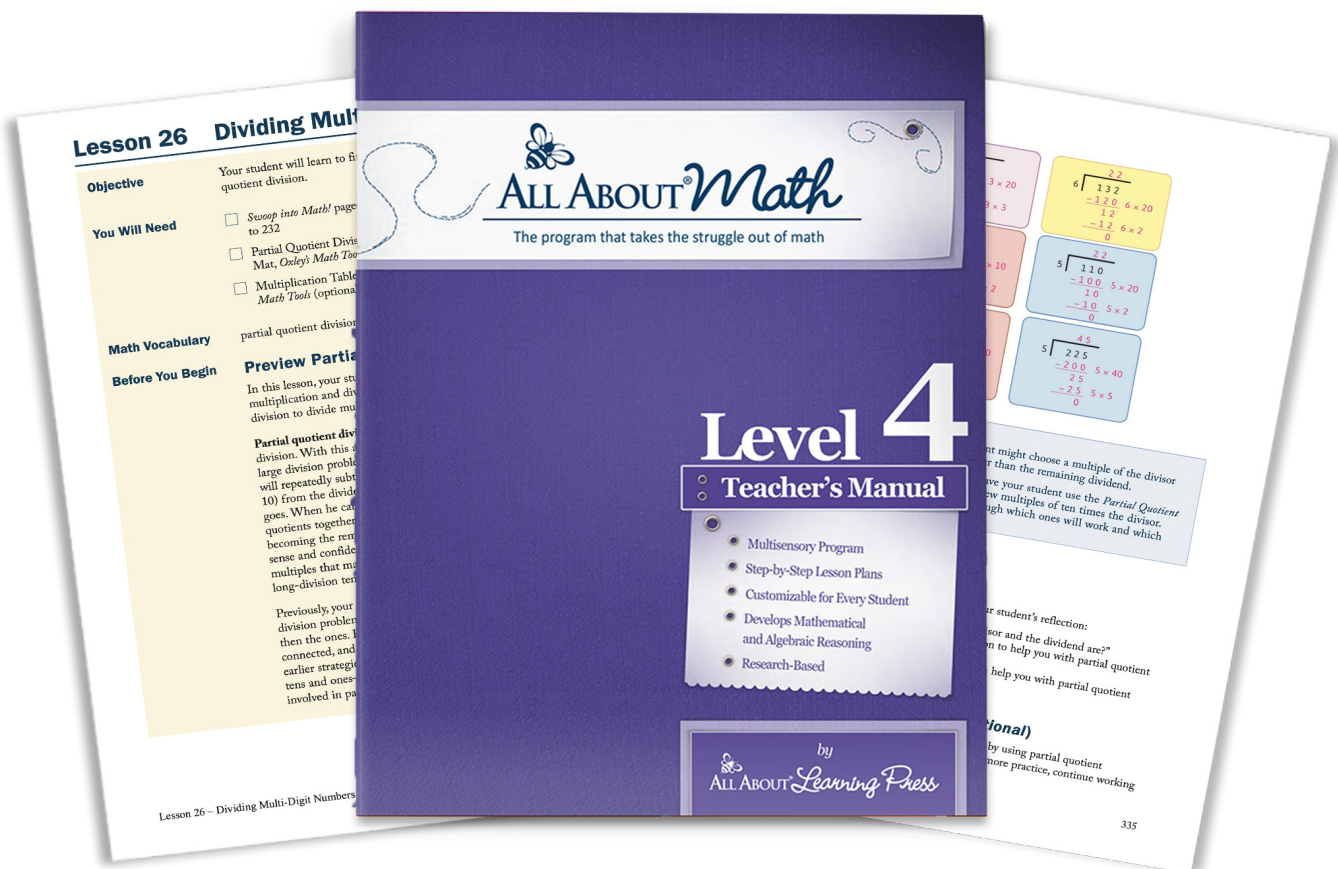


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1

Preparing for Level 4

Start Here!

To prepare for teaching *All About Math* Level 4, 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-4 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 3, use this checklist and the *Swoop into Math!* activity book pages 391 to 399 to verify placement in Level 4. Your student should get all items in a question correct in order to checkmark that question.

1. Your student can read and write fractions. Have your student write and read the fraction represented by the shaded model on the student activity page.
- Model 1:** (Answer: $\frac{7}{8}$) **Model 2:** (Answer: $\frac{7}{3}$ or $2\frac{1}{3}$) **Model 3:** (Answer: $\frac{2}{6}$)
2. Your student can identify and name fractions on a number line. Have your student count the number of parts on each number line and label the tick marks with a fraction. He should also label each whole number as a fraction.
- Number Line 1:** (Answer: $\frac{1}{3}, \frac{2}{3}, \frac{3}{3}$)
- Number Line 2:** (Answer: $\frac{1}{4}, \frac{2}{4}, \frac{3}{4}, \frac{4}{4}, \frac{5}{4}, \frac{6}{4}, \frac{7}{4}, \frac{8}{4}$)
3. Your student can determine if two fractions are equivalent. To test this, have your student shade the models and then circle yes or no.
- $\frac{2}{3}$ and $\frac{4}{6}$ (Answer: yes) $\frac{1}{2}$ and $\frac{3}{8}$ (Answer: no)
4. Your student can compare two fractions with the same numerator and two fractions with the same denominator using the correct comparison symbol. To test this, read the situations in question 5 aloud. Your student will use the models and then the number lines to determine the correct comparison symbol to make the statement true, and explain how he found the answer.
- $\frac{3}{8}$ and $\frac{3}{4}$ (Answers: $\frac{3}{8} < \frac{3}{4}$, The model for three-fourths has more of the rectangle shaded than the model for three-eighths.)
- $\frac{5}{6}$ and $\frac{1}{6}$ (Answers: $\frac{5}{6} > \frac{1}{6}$, The number line shows that five-sixths is closer to one than one-sixth.)
5. Your student can represent equal groups using a multiplication expression, a repeated addition expression, a tape diagram, and an array. Have your student complete the table on the student activity page.
- Multiplication Expression:** (Answer: 4×5)
- Repeated Addition Expression:** (Answer: $8 + 8 + 8$)
- Tape Diagram:** (Answer: rectangle divided into four equal groups, and each section labeled with a five)
- Array:** (Answer: three rows with eight in each row)

6. Your student can represent a multiplication story problem with an array and an equation. To test this, read the story problems in question 7 aloud. Have your student create an array and then write an equation that represents the problem. He will represent the unknown in the equation with a blank. Then, have him use the array to answer the question.

Peppers (Answers: 6 rows with 5 in each row, $___ \times 5 = 30$, 6 boxes)

Lettuce (Answers: 7 rows with 7 in each row, $7 \times 7 = ___$, 49 lettuce plants)

7. Your student can write two multiplication and division equations for an array. To test this, have your student write two multiplication equations and two division equations for the array shown on the student activity page.

Multiplication: (Answers: $7 \times 3 = 21$, $3 \times 7 = 21$)

Division: (Answers: $21 \div 7 = 3$, $21 \div 3 = 7$)

8. Your student can identify multiplication facts and their related division facts. Have your student fill in the blank number sentences based on the given number sentence on the student activity page.

$9 \times 7 = 63$ (Answers: $7 \times 9 = 63$, $63 \div 7 = 9$, and $63 \div 9 = 7$)

$48 \div 6 = 8$ (Answers: $48 \div 8 = 6$, $6 \times 8 = 48$, and $8 \times 6 = 48$)

9. Your student can multiply a one-digit number by a two-digit number. On the student activity page, have your student find the product for each multiplication equation using a tape diagram, manipulatives, or another strategy.

$3 \times 24 = ___$ (Answer: 72) $6 \times 16 = ___$ (Answer: 96)

10. Your student can divide within 100. Your student may use a model or a related multiplication fact to find the quotient in each equation on the student activity page.

$84 \div 4 = ___$ (Answer: 21) $98 \div 7 = ___$ (Answer: 14)

11. Your student can represent and solve two-step story problems by using the four operations. To test this, read each story problem in question 11 aloud. Have your student create equations based on the information given in the story problem, using a letter for an unknown amount. Then, have him use the equation to solve the story problem on the student activity page.

Nature preserve (Answers: $3 \times 21 = w$, $63 + 29 = t$, 92 woodpeckers)

Birdwatcher (Answers: $5 \times 8 = h$, $40 - 14 = t$, 26 hummingbirds)

12. Your student can read and write a nine-digit whole number in standard form and identify the place and value of each digit. To test this, have your student read the number and then explain the place and value of each digit. Then, he will read another number (help read it aloud as needed) and write it in standard form on the line.

Answers: 513,462,891 is read aloud as five hundred thirteen million, four hundred sixty-two thousand, eight hundred ninety-one

For place and value, if your student is unsure, point to the 6 and say, “The 6 is in the ten thousands place and has the value of sixty thousand.” Then, have your student provide the place and value of the rest of the digits.

5: hundred millions place, value is five hundred million

1: ten millions place, value of ten million

3: millions place, value of three million

4: hundred thousands place, value of four hundred thousand

6: ten thousands place, value of sixty thousand

2: thousands place, value of two thousand

8: hundreds place, value of eight hundred

9: tens place, value of ninety

1: ones place, value of one

Answer: 392,465,785

13. Your student can compare two multi-digit numbers within 1,000,000 by using comparison symbols ($>$, $<$, $=$) to show greater than, less than, or equal to. To test this, have your student compare each pair of numbers on the student activity page.

791,391 _____ **782,591** (*Answer:* $>$) **219,048** _____ **219,182** (*Answer:* $<$)

14. Your student can order a set of three multi-digit numbers within 1,000,000 from least to greatest or greatest to least. Have your student list the numbers in the correct order on the student activity page.

Least to Greatest: (*Answer:* 311,745; 392,902; 421,310; 512,124)

Greatest to Least: (*Answer:* 791,458; 731,455; 722,031; 712,416)

15. Your student can round numbers within 1,000,000 to the nearest thousands, ten thousands, and hundred thousands. Have your student complete the table on the student activity page. He can use a number line to solve these problems.

675,453: (*Answer: Rounded to the nearest thousands is 675,000; rounded to the nearest ten thousands is 680,000; rounded to the nearest hundred thousands: 700,000*)

392,794: (*Answer: Rounded to the nearest thousands is 393,000; rounded to the nearest ten thousands is 390,000; rounded to the nearest hundred thousands is 400,000*)

16. Your student can identify and name 2D and 3D shapes and features. To test this, have your student complete the table on the student activity page.

Answers: cone, angle, parallel, cylinder, quadrilateral

How did your student do?

- If your child could easily complete 14 or more of the 16 skills, begin Level 4.
- If just one or two areas were difficult, you can remediate in those areas as you start Level 4.
- If 13 or fewer boxes were checked, start with Level 3 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 of the program to accommodate your child's needs, feel free to call us at 715-477-1976 or email us at support@allaboutlearningpress.com. And if you need ideas on how to help your child build skills, just let us know—we are always happy to help!



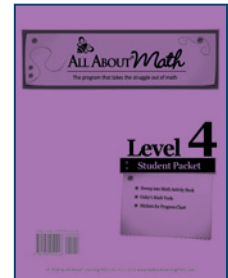
Gather the Materials

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

1 Student Packet

The Student Packet contains:

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



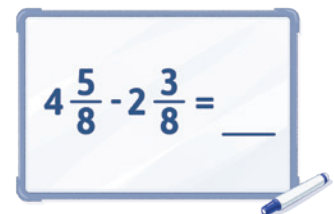
2 All About Math Manipulatives Kit

The manipulatives kit includes hands-on materials to support learning. See page 25, Learn about Manipulatives, for more details about the manipulatives for Level 4.



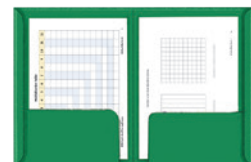
3 Dry-erase board and Markers

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 *Oxley's Math Tools*. You may also want a folder for storing Oxley'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 53.
- **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 12 on page 159.

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. **Oxley'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 521. 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:

- “How can you represent a decimal on the hundredths grid?”
- “How does place value help you read a decimal number?”
- “What is something you would like to practice more?”

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.

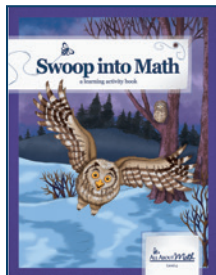
Encourages a Positive Attitude Toward Math: By encouraging your student to talk about his learning, you help him see math as a subject he can engage with and discuss, rather than a subject that is difficult or intimidating. Positive discussions about math help develop a healthy attitude toward the subject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

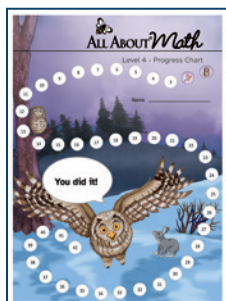


- Progress Chart
- *Daily Review Tracker*
- Activity Sheets
- Oxley's Math Fun!
- Math Practice
- Story Problems and Situations
- Certificate of Achievement

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	Skills	Mastered	Not Mastered
1	Place value		
2	Place value		
3	Place value		
4	Place value		
5	Place value		
6	Place value		
7	Place value		
8	Place value		
9	Place value		
10	Place value		
11	Place value		
12	Place value		
13	Place value		
14	Place value		
15	Place value		
16	Place value		
17	Place value		
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41	Place value		
42	Place value		
43	Place value		
44	Place value		
45	Place value		
46	Place value		
47	Place value		
48	Place value		
49	Place value		
50	Place value		

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.

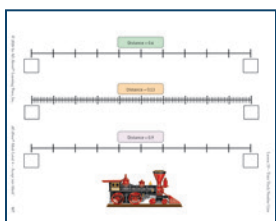
Starting in Lesson 6, you will be prompted to enter the date next to skills that have been introduced. This will help you track which skills have been taught and should be included as part of your daily review.

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

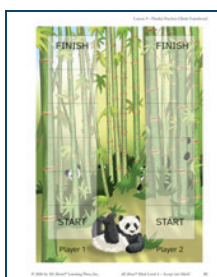
The activity sheets are highly motivating for most students, offering a variety of ways to practice the new concepts introduced in each lesson. They include engaging themes and colorful visuals that make learning both fun and meaningful.



Take a look at the activity called Train Track Number Line on page 167 of the activity book. In this activity, your student will mark the location of each train along the provided number line.

Oxley'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.



Oxley'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 Oxley'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 389 of the activity book.



Presenting your student with a certificate upon completing the Level 4 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 several 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:

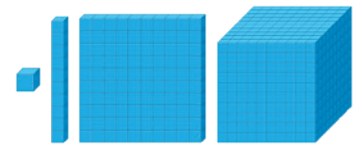


- **Multiplication and Division:** Connecting cubes can be used to model multiplication and division by creating equal groups or arrays. The cubes make it easier to see how multiplication works as repeated addition and how division works as sharing or grouping.
- **Fractions:** Different colored connecting 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.



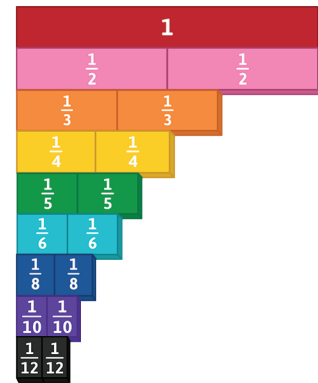
Base-10 Blocks also known as **place value blocks**, represent units of 1, 10, 100, and 1000. They can be used for:



- **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.



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.

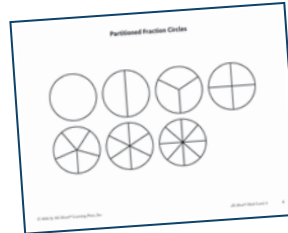




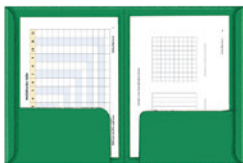
Preview Oxley's Math Tools

Math Tools are printed resources that can be used in numerous ways to support student learning. In Level 4, Math Tools are primarily used to support operations and algebraic thinking. These tools include:

- Nine-Digit Place Value Chart
- Fraction Shapes
- Open Number Line
- Partitioned Fraction Circles
- Multiplication Table
- Fraction Models
- Number Cards
- Elapsed Time Clock
- Units of Measurement Cards
- Partitioned Fraction Rectangles
- Equivalent Fractions Mat
- Tenths and Hundredths Grids
- Fractions and Decimals Mat
- Decimal Place Value Chart
- Types of Angles Mat
- Dot Paper
- Classifying Shapes Cards
- Tenths and Hundredths Number Lines
- Partial Quotient Division Mat
- Pattern Cards



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 special friend!
My name is Oxley. What's yours?

I'm a barred owl, and I love flying around.
So while there is a lot for you to
learn in Level 4, owl be swooping in often
to encourage you along the way.
Together we are going to have such fun!

Whhoooweee—here we go!



Lesson 8

Relating Fractions to Benchmarks

Objective

Your student will learn to compare the sizes of fractions by comparing them to the benchmarks of $\frac{1}{2}$ and 1.

You Will Need

- Swoop into Math!* pages 63 to 68
- Open Number Line, *Oxley's Math Tools*
- dry-erase board, pocket, and marker
- Fraction Tiles
- Partitioned Fraction Rectangles, *Oxley's Math Tools*
- Units of Measurement Cards, *Oxley's Math Tools* page 14

Math Vocabulary

benchmark numbers

Before You Begin

Preview Benchmark Numbers

In this lesson, your student will understand the sizes of fractions by using benchmark numbers. In math, benchmark numbers are reference points that help compare, estimate, or make calculations easier.

For example:

- 10, 100, and 1,000 are some whole benchmark numbers. When estimating how much something costs or weighs, people often round to the nearest hundred or thousand.
- $\frac{1}{2}$, $\frac{1}{4}$, and $\frac{3}{4}$ are benchmark fractions that are often used to quickly compare other fractions or to approximate. If you have $\frac{2}{5}$, you might round it to $\frac{1}{2}$ for an easier estimate.

The benchmark numbers for this lesson are $\frac{1}{2}$, one, and two. For example, your student knows that if a whole is split into four parts, it takes four parts to make one whole. If a fraction has more than four parts, it is greater than one; if it has fewer than four parts, it is less than one. He can also use his understanding of equivalent fractions from previous lessons to help compare fractions. Since he knows that $\frac{2}{4}$ is equivalent to $\frac{1}{2}$, he knows the fraction $\frac{1}{4}$ must be less than the benchmark number $\frac{1}{2}$.

This lesson is important to help your student's number sense with fractions. Knowing the fractions' relationship to the benchmark numbers will help him compare fractions that have unlike numerators and denominators in future lessons.



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

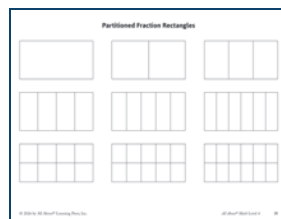
Turn to page 63 in the *Swoop into Math!* activity book.

“Let’s review solving two-step story problems. Read the story problems, and solve each one.”

Answer Key

- 903 total yards
- 210 pieces of trash
- 414 water bottles left

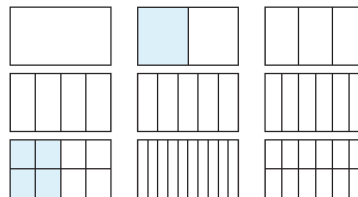
Representing Equivalent Fractions



Partitioned Fraction Rectangles

Find the *Partitioned Fraction Rectangles* from *Oxley's Math Tools*. Place the page into the dry-erase pocket.

“Let’s review equivalent fractions! Draw models by using the *Partitioned Fractions Rectangles* to show that the fraction $\frac{4}{8}$ is equivalent to $\frac{1}{2}$.”



Review (continued)

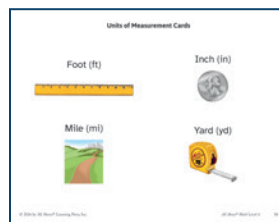
“Explain how you know that these fractions are equivalent.” *I shaded one-half of one rectangle and four-eighths of another, and the same amount of space is shaded in each one.*

“Explain and show me how you can use the fraction tiles to find a fraction with a denominator of four that is equivalent to $\frac{3}{12}$.”
Three one-twelfth tiles equal a one-fourth tile.

New Teaching

Customary Length Units of Measurement

“Before we dive into our main lesson, let’s explore some common customary units for measuring length. We use customary units of length to measure how long, tall, or far something is. Inches, feet, yards, and miles are all part of the customary system used mostly in the United States.”

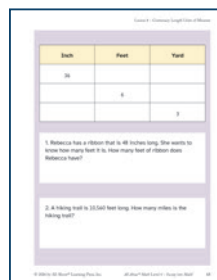


Units of Measurement Cards

Find the *Units of Measurement Cards* from *Oxley’s Math Tools* on page 14. Separate and place these cards in front of your student.

“These cards include things like inches, feet, yards, and miles. Where have you heard of these words?” (*Answers may include: using a ruler, height, football, speed of a car, road signs, etc.*)

Use the guided questions on the back to discuss the different measurement units with your student.



Customary Length Units of Measure

Find *Customary Length Units of Measure* in the *Swoop into Math!* activity book, page 65.

“Let’s practice converting between different units of measurement and fill out the table. We can use multiplication or division to help us. We know there are 12 inches in 1 foot. Let’s use this to help us find out how many feet are equivalent to 36 inches.”

Write $12 \times 2 = \underline{\quad}$ and $12 \times 3 = \underline{\quad}$ on the dry-erase board.

New Teaching
(continued)

“Find the product of both equations. (*Answer: $12 \times 2 = 24$, $12 \times 3 = 36$*)
Which equation has a product of 36?” ($12 \times 3 = 36$)

“Yes. Three feet is equivalent to 36 inches. Write 3 in the first box under the Feet column.”

Inch	Feet	Yard
36	3	
	6	
		3

“Now, think about how many feet are in a yard.” (*Answer: three*)

“Good. Fill in the table to reflect this. Now we know that 36 inches is equivalent to 3 feet, which is equivalent to 1 yard.”

Continue to practice by completing the table.

Inch	Feet	Yard
36	3	1
72	6	2
108	9	3

“Let’s solve a story problem with these units of measurement.”

Story Problem #1: Rebecca has a ribbon that is 48 inches long. She wants to know how many feet it is. How many feet of ribbon does Rebecca have?

“How can we solve this problem?” *We can use multiplication to help us. We need to find out what number times 12 equals 48.*

“Yes. How many feet are equivalent to 48 inches?” *Four feet.*

“Nice. Let’s do another one.”

Story Problem #2: A hiking trail is 10,560 feet long. How many miles is the hiking trail?

“What do we know, and what are we trying to find out?” *We know that the trail is 10,560 feet long. We need to find out how many miles that is.*

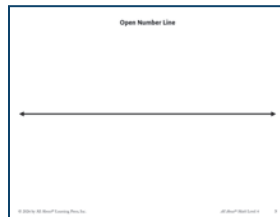
“Yes. How can we solve this problem?” *There are 5,280 feet in one mile. We can use multiplication to help us. We need to find out what number times 5,280 equals 10,560.*

“Good. How many miles are equivalent to 10,560?” *Two miles.*

New Teaching (continued)

“Nice. You learned how to convert customary length units. Now let’s get into the main lesson and use benchmark numbers to compare fractions.”

Between One-Half and One Whole

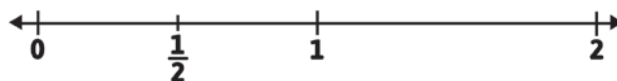


Open Number Line

Find the *Open Number Line* from *Oxley’s Math Tools*. Place it into the dry-erase pocket.

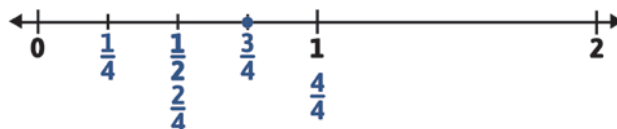
“A group of hikers is hiking a two-mile trail. Along the trail, there are markers to help them figure out where they are. An open number line can be used to represent the trail the hikers are on.”

Add tick marks at the beginning, middle, and end of the *Open Number Line*. Label the tick marks with zero, one, and two. Then add a tick mark between 0 and 1 and label it $\frac{1}{2}$.



“We can use this number line to help us answer questions about the hikers. I have already marked some numbers on the number line. The numbers zero, $\frac{1}{2}$, one, and two are benchmark numbers. **Benchmark numbers** are numbers that can help us understand the sizes of fractions and how they compare to each other. We will use these benchmark numbers to answer questions about the hikers.”

“One hiker takes a water break at $\frac{3}{4}$ of a mile (write $\frac{3}{4}$ on the dry-erase board). Let’s find out if the hiker stops before or after one mile. We can mark this fraction on the *Open Number Line* to help us.” Have your student add shorter tick marks for fourths and put a point at $\frac{3}{4}$.



“Is this fraction greater than or less than the benchmark number one?”
Less than.

“Right. The fraction $\frac{3}{4}$ is less than the benchmark number one because it is three parts away from zero. (Point to the three parts.) We need to go one more part to be equal to one.”

New Teaching

(continued)

“How does the benchmark $\frac{1}{2}$ compare to the fraction $\frac{3}{4}$?”
Three-fourths is to the right of one-half.

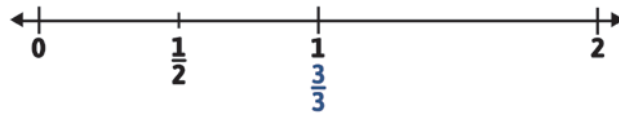
“That means $\frac{3}{4}$ is greater than $\frac{1}{2}$ but less than one whole. By comparing $\frac{3}{4}$ to the benchmarks of $\frac{1}{2}$ and one, we learned about the value $\frac{3}{4}$. You figured out that the hiker stopped before one mile but went more than $\frac{1}{2}$ a mile.” Keep the numbers zero, $\frac{1}{2}$, one, and two on the *Open Number Line*, and clear the rest. Clear the dry-erase board.

Greater than One Whole

“Let’s use the *Open Number Line* and benchmark numbers to find the value of another fraction. A red-bellied woodpecker was spotted on a hiking trail at $\frac{4}{3}$ miles. Let’s find out how far down the trail the bird was spotted so we can tell our friends.” Write the fraction $\frac{4}{3}$ on the dry-erase board.

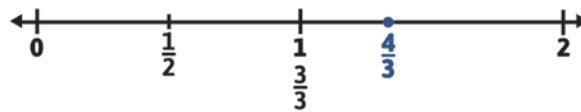
“What do you notice about $\frac{4}{3}$ that can help us figure out where to put it on the *Open Number Line*?” *I notice that the denominator is three. I see that the numerator is greater than the denominator.*

“Good. I know that the fraction $\frac{3}{3}$ is equal to one. Write the fraction $\frac{3}{3}$ under the one on the *Open Number Line*.”



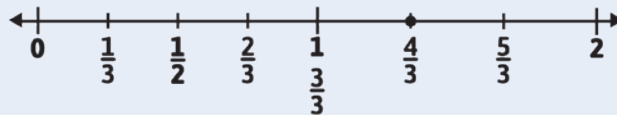
“Is $\frac{4}{3}$ greater than or less than $\frac{3}{3}$?” *Greater than.*

“Right. I can place the fraction after the benchmark number one on the number line (add a point and label on the *Open Number Line* for the fraction $\frac{4}{3}$). Do you think this fraction is greater than two? Explain your reasoning.” *I do not think that this fraction is greater than two. It would take six-thirds to equal two, and this is only four-thirds.*



New Teaching (continued)

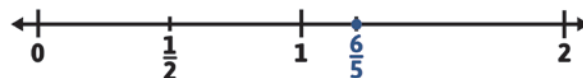
If your student is unsure how to explain his reasoning, encourage him to add tick marks and labels to the *Open Number Line* up to the number 2 (or $\frac{6}{3}$).



“That’s right. This fraction is greater than the benchmark one but less than two. We would need to go two more spaces to equal two. The fraction $\frac{4}{3}$ is $\frac{1}{3}$ greater than one.”

Keep the numbers zero, $\frac{1}{2}$, one, and two on the *Open Number Line* and clear the rest. Clear the dry-erase board.

“Let’s try another one. A hiker went $\frac{6}{5}$ miles along the Pacific Coast Trail before stopping to adjust her pack (write $\frac{6}{5}$ on the dry-erase board). Did this hiker stop before or after the one-mile marker? Mark where you think $\frac{6}{5}$ should go on the *Open Number Line*, and then explain why you put it there.” *I put six-fifths after the one but before the two. I marked it closer to one than to two because I think it is just one-fifth after one.*



“Notice that the numerator is greater than the denominator in $\frac{4}{3}$ and $\frac{6}{5}$. When the numerator is larger than the denominator, the fraction is larger than the number one benchmark.”

Keep the benchmarks zero, $\frac{1}{2}$, one, and two on the *Open Number Line* and clear the rest. Clear the dry-erase board.

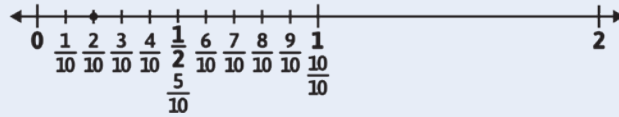
Less than One-Half

“A trail guide map says that a waterfall is along the hike at $\frac{2}{10}$ of a mile (write $\frac{2}{10}$ on the dry-erase board). What do you notice about $\frac{2}{10}$ that can help you figure out where to place it on the number line?” *I noticed that the numerator is two and that the denominator is ten.*

“Good. The denominator helps determine where to place a fraction. Using the denominator of ten, you can think about where $\frac{1}{2}$ would be and where one whole would be. What fractions with a denominator of ten are equal to $\frac{4}{3}$ and to one whole?” *Five-tenths is equal to one-half, and ten-tenths is equal to one whole.*

New Teaching (continued)

If your student is unsure how to find the equivalent fractions, add tick marks and labels to the *Open Number Line* to represent the tenths.



“Right. Since five is half of ten, $\frac{5}{10}$ is equal to $\frac{1}{2}$. When the denominator is ten and the numerator is ten, the fraction represents one whole. Using what you know about $\frac{2}{10}$, place it on the number line, and then explain why you chose that spot.” *I placed two-tenths before one-half because two-tenths is less than five-tenths.*

“How far away is $\frac{2}{10}$ from the benchmark one?” *Eight more spaces.*

“Good. The fraction $\frac{2}{10}$ is less than the benchmark $\frac{1}{2}$.” Keep the benchmarks zero, $\frac{1}{2}$, one, and two on the *Open Number Line* and clear the rest. Clear the dry-erase board.

“Let’s try another one! A hiker began a hike but turned around after going only $\frac{2}{6}$ of the way because it was getting dark (write $\frac{2}{6}$ on the dry-erase board). Find the benchmark number that the hiker gets the closest to on the *Open Number Line*. Mark where you think $\frac{2}{6}$ should go on the number line, and then explain why you chose that spot.” *I marked two-sixths before one-half. I know that it takes three-sixths to make one-half because three is half of six, so two-sixths comes before one-half.*

“You can use the relationship between the numerator and the denominator to help place fractions on the number line. If you have sixths, then half of six is three. Because two is less than three, you know that $\frac{2}{6}$ comes before $\frac{1}{2}$ on the number line. How far away was the hiker from the $\frac{1}{2}$ marker?” *Two-sixths is one-sixth away from one-half.*

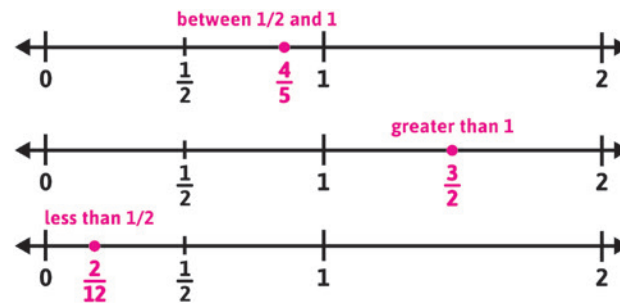
“How far away from the number one benchmark was the hiker?” *The hiker was four-sixths of the way from the benchmark one.*

“Since $\frac{3}{6}$ is equivalent to $\frac{1}{2}$, it takes one more sixth to be at one-half. Using benchmark numbers like $\frac{1}{2}$ and one can help you reason about how fractions compare.”

Have your student determine if the fractions $\frac{4}{5}$, $\frac{3}{2}$, and $\frac{2}{12}$ are less than $\frac{1}{2}$, between $\frac{1}{2}$ and one, or greater than one, and explain his reasoning. Ask your student to tell you how far away the fraction is from the benchmark one. If needed, use the *Open Number Line* to help.

New Teaching (continued)

Answer Key



Complete Activity Sheet

“Let’s use benchmark fractions to compare the sizes of fractions!”

Fraction	Less than $\frac{1}{2}$	Between $\frac{1}{2}$ and 1	Greater than 1	Distance from 1
$\frac{2}{10}$	✓			$\frac{8}{10}$
$\frac{8}{12}$				$\frac{4}{12}$
$\frac{6}{4}$				$\frac{2}{4}$
$\frac{2}{8}$				$\frac{6}{8}$
$\frac{9}{10}$				$\frac{1}{10}$
$\frac{13}{12}$				$\frac{1}{12}$

Spotting Animals Along the Trail

Turn to page 67 in the *Swoop into Math!* activity book.

“The table shows different points along a two-mile hike where animals were spotted. Place a checkmark to answer if the fraction is less than $\frac{1}{2}$, between $\frac{1}{2}$ and one, or greater than one. Use what you know about fractional parts to write how far each fraction is from one. You can use the *Open Number Line* to help you if needed.”

Answer Key

Fraction	Less than $\frac{1}{2}$	Between $\frac{1}{2}$ and 1	Greater than 1	Distance from 1
$\frac{2}{10}$	✓			$\frac{8}{10}$
$\frac{8}{12}$		✓		$\frac{4}{12}$
$\frac{6}{4}$			✓	$\frac{2}{4}$
$\frac{2}{8}$	✓			$\frac{6}{8}$
$\frac{9}{10}$		✓		$\frac{1}{10}$
$\frac{13}{12}$			✓	$\frac{1}{12}$

New Teaching (continued)



Look For

Some students might struggle to know how far away each fraction is from the benchmark one.

Here's How to Help: Have your student represent one in terms of a fraction. Use the same denominator as the fraction your student needs to compare. For example, if your student is comparing fourths, $\frac{4}{4}$ equals one. Then, your student can look at the numerator to see how much less than or greater than $\frac{4}{4}$ it is.

Math Reflection

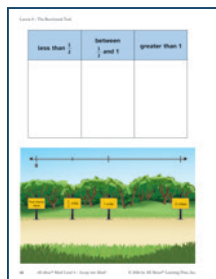
“Let’s Reflect!”

Ask some questions to guide your student’s reflection:

- “How are benchmark fractions, such as $\frac{1}{2}$ and one, helpful when you think about other fractions?”
- “How can you use the relationship between the numerator and the denominator to explain that $\frac{4}{3}$ is greater than one?”
- “What is something that you enjoyed about today’s lesson?”

Extended Practice (Optional)

If your student is not able to relate fractions to benchmarks, or he expressed the need for more practice, continue working on this skill.



The Benchmark Trail

Turn to page 68 in the *Swoop into Math!* activity book. Place the activity page into the dry-erase pocket.

“A group of hikers stopped at different locations along a two-mile trail. Place the following fractions on the number line, compare them to the benchmark numbers, and then fill in the chart with where each fraction belongs.”

Write the fractions on the dry-erase board.

$$\frac{3}{8}, \frac{7}{4}, \frac{1}{6}, \frac{5}{6}, \frac{2}{3}, \frac{5}{4}$$

New Teaching

(continued)

Answer Key

Lesson 8 – The Benchmark Trail

less than $\frac{1}{2}$	between $\frac{1}{2}$ and 1	greater than 1
$\frac{1}{6}$	$\frac{2}{3}$	$\frac{5}{4}$
$\frac{3}{8}$	$\frac{5}{6}$	$\frac{7}{4}$

68 All About® Math Level 4 – Swoop into Math! © 2026 by All About® Learning Press, Inc.

Your student will continue to relate fractions to benchmarks in future lessons. You can proceed to the next lesson without full mastery of this skill.

Oxley's Math Fun!

Trail Race!

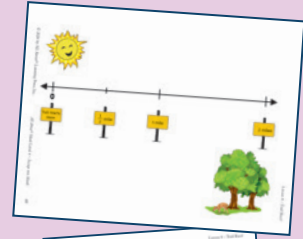
“Let’s practice our math skills!”

Materials

- Trail Race Gameboard, *Swoop into Math!* page 69
- Trail Race Fraction Cards, *Swoop into Math!* page 71
- dry-erase pocket and marker

Directions

1. Cut apart the *Trail Race* fraction cards. Mix them up and pass out the cards equally to the two players. Keep the cards face down in two stacks.
2. Place the *Trail Race* gameboard into the dry-erase pocket.
3. Each player turns over a card from his stack at the same time and then writes the fraction from his card on the number line on the *Trail Race* gameboard by using the benchmark numbers.
4. The player with the fraction beyond the larger benchmark keeps both cards. If both fractions fall between the same benchmark numbers (for example, $\frac{2}{3}$ and $\frac{3}{4}$ are both between $\frac{1}{2}$ and 1), each player keeps the card he drew.
5. The game continues until all the cards are gone.
6. The player with the most cards at the end is the winner!



Answer Key

Less than $\frac{1}{2}$: $\frac{1}{3}$, $\frac{1}{4}$, $\frac{1}{6}$, $\frac{1}{8}$, $\frac{2}{8}$, $\frac{3}{10}$, $\frac{4}{12}$

Between $\frac{1}{2}$ and 1: $\frac{2}{3}$, $\frac{3}{4}$, $\frac{3}{5}$, $\frac{5}{6}$, $\frac{5}{8}$, $\frac{7}{8}$, $\frac{6}{10}$, $\frac{10}{12}$, $\frac{11}{12}$

More than 1: $\frac{4}{3}$, $\frac{5}{4}$, $\frac{6}{4}$, $\frac{7}{4}$

Track Your Progress

Mark the Progress Chart



Have your student mark Lesson 8 on the Progress Chart.

Lesson 16 Representing and Identifying Equivalent Fractions and Decimals

Objective

Your student will learn to reason about equivalent tenths and hundredths using decimal notation.

You Will Need

- Swoop into Math!* pages 133 to 135
- Fractions and Decimals Mat, *Oxley's Math Tools*
- Tenths and Hundredths Grids, *Oxley's Math Tools*
- Base-10 Blocks (optional)
- dry-erase board, pocket, and marker
- glue

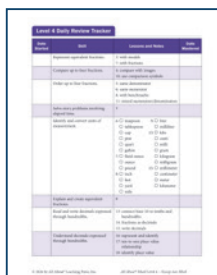
Before You Begin

Preview Representing and Identifying Decimals that Are Equivalent

In the previous lesson, your student practiced identifying decimals from representations such as fractions or fraction models. He made connections between these representations to help him write each value as a decimal. In this lesson, he will use that knowledge to explore decimal equivalents.

Your student will be presented with models and may use base-10 blocks as a support to build an understanding that one tenth is equivalent to ten hundredths. This understanding will then be applied when comparing two values written in decimal notation to determine whether they are equivalent.

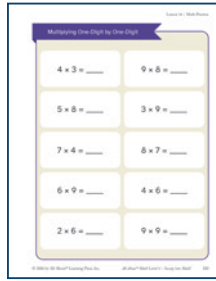
Review



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

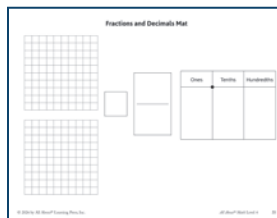
Turn to page 133 in the *Swoop into Math!* activity book.

“Let’s practice our multiplication facts! Write the product for each equation.”

Answer Key

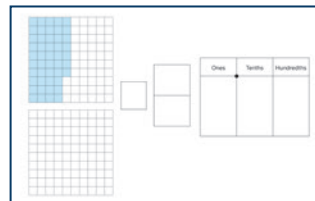
- $4 \times 3 = 12$
- $5 \times 8 = 40$
- $7 \times 4 = 28$
- $6 \times 9 = 54$
- $2 \times 6 = 12$
- $9 \times 8 = 72$
- $3 \times 9 = 27$
- $8 \times 7 = 56$
- $4 \times 6 = 24$
- $9 \times 9 = 81$

Writing Decimals from Other Representations



Fractions and Decimals Mat

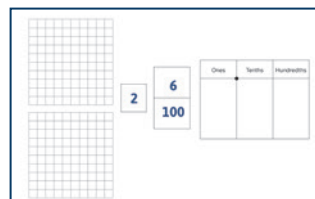
Find the *Fractions and Decimals Mat* from *Oxley’s Math Tools*. Place it into the dry-erase pocket. Shade in 47 small boxes on the hundredths grid.



“I’ve shaded the model to represent a decimal. Write the decimal on the place value chart.” (*Answer: 0.47*)

“How did you know to write the four in the tenths place?” *The grid shows four columns that are completely shaded. Each column represents a tenth.*

Clear the dry-erase pocket. Write the mixed number $2\frac{6}{100}$.



Review (continued)

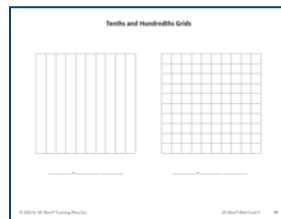
“This time, I’ve written a mixed number. Write its value as a decimal.”
(Answer: 2.06)

“I notice that the two is written to the left of the decimal point. What does that mean?” *There are two wholes.*

“Good. Let’s explore more about fractions and decimals, and how we can represent equivalent values.”

New Teaching

Identifying Equivalent Decimals

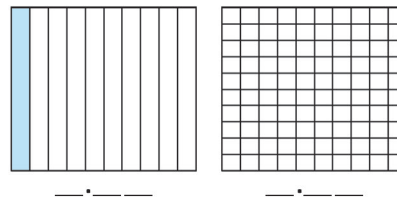


Tenths and Hundredths Grids

Find the *Tenths and Hundredths Grids* from *Oxley’s Math Tools*. Place this page into the dry-erase pocket.

“Let’s imagine we are at the beach with a marine life conservation group. The group has identified ten sea turtle nests along the beach. One hundred sea turtles just hatched from one of the nests and are making their way to the ocean!”

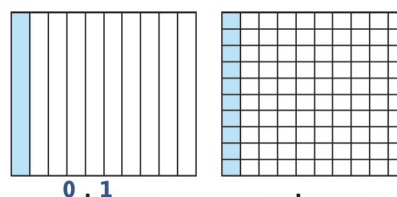
On the *Tenths and Hundredths Grids*, shade in one column on the grid that is separated into tenths.



“This model represents the number of nests that have hatched so far. What amount is represented here?” *One-tenth.*

“Yes. Write the decimal for one-tenth below the model.” (Answer: 0.1)

On the *Tenths and Hundredths Grids*, shade the first column on the grid, which is separated into hundredths.



New Teaching

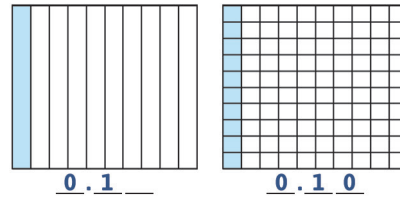
(continued)

“I’ve made another model to represent the number of baby sea turtles with spots. What amount is represented here?” *Ten-hundredths.*

“Write ten-hundredths as a decimal below the model.” (*Answer: 0.10*)

“What do you notice about these two models?” *The same amount is shaded in.*

“Since the same amount is shaded in both models, the two values are equivalent. But I notice that the decimals look a little different.”



“What do you notice when you compare the decimals for these two models?” *One has only one digit after the decimal point, and the other has two digits after the decimal point. They both have a one in the tenths place.*

“You’re right. The two decimals are equivalent because they represent the same amount. Let’s figure out why the decimals are equivalent even though they look a little different. When I look at the two decimals you wrote, I see that they both have a zero before the decimal point. What does that tell us?” *They are both less than one whole.*

“Now, let’s look at the decimal point. Remember, the first place after the decimal point is the tenths place. How many tenths does each decimal show?” *One-tenth.*

“Right! Each model has one-tenth. In this model (point to the grid separated into tenths), we shaded in one-tenth. In this model (point to the grid separated into hundredths), we shaded in ten-hundredths, but it also looks like one-tenth. That is because ten-hundredths make up one-tenth.”

If your student struggles with this idea, use the base-10 blocks to help make the connection. Start with a base-10 flat, and tell your student that we can think of this block as representing one whole, just like the hundredths grid. Place a base-10 rod on top of the flat so that it aligns with the leftmost column. Tell your student we can think of the base-10 rod as a tenth. We need ten rods to make a whole. Just like we’ve broken apart a rod to help us add and subtract, we can break apart a rod to represent smaller units. Trade the base-10 rod for ten base-10 units to help him see that they are equivalent.



New Teaching

(continued)

“What do you see in the hundredths place of each decimal?” *One is blank, and the other has a zero.*

“Good! Zero means nothing. So, writing a zero here or leaving it blank represents the same value, zero. So, the decimals 0.1 and 0.10 represent the same amount. They’re equivalent.”

Clear the *Tenths and Hundredths Grids*. On the dry-erase board, write the fractions $\frac{4}{10}$ and $\frac{40}{100}$.

“I’ve written two fractions on the dry-erase board. Each fraction represents the length of the beach the turtles must cross to reach the ocean.”

“Write each fraction as a decimal on the dry-erase board.”
(*Answer: 0.4 and 0.40*)

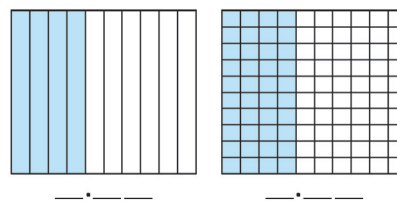
“Tell me the two decimals you wrote.” *Zero and four-tenths and zero and forty-hundredths.*

“I’m wondering if these two values are also equivalent. What do you think?” If your student recognizes that the values are equivalent and explains how he knows, you can move on to the next example. If he is unsure, continue with the following scripting.

“I see that both of the decimals you wrote have zero ones (point to the zero before the decimal). How many tenths are there in each decimal?” *Four.*

“That is also the same. What about the hundredths?” *One has a zero, and the other is blank.*

“Since they both have nothing in the hundredths place, they’re equivalent. Shade in the grids on the *Tenths and Hundredths Grids* to check our work.”



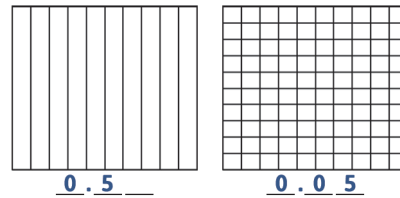
“The same amount is shaded! Just like fractions, decimals can be equivalent too!”

Clear the *Tenths and Hundredths Grids* and the dry-erase board. Write the fractions $\frac{5}{10}$ and $\frac{5}{100}$ on the dry-erase board.

New Teaching

(continued)

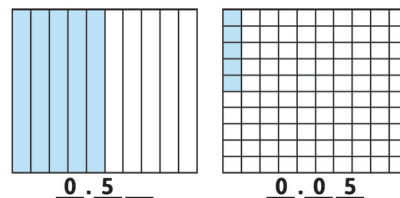
“These fractions represent the length of the beach that the sea turtles from two other nests need to cross to reach the ocean. Let’s figure out if the values are equivalent. Write each fraction as a decimal at the bottom of the *Tenths and Hundredths Grids*.”



Your student might write $\frac{5}{100}$ as 0.5. Remind him of the location of the hundredths place in the decimal, or have him shade the grid to recognize that $\frac{5}{100}$ has zero tenths.



“These decimals look similar but not quite the same. This time, I noticed that after the decimal point, there is a zero before the five (point to 0.05). This tells us there are no tenths in this number. But when I look at the other decimal, I see five-tenths (point to 0.5). I know five-tenths is more than zero-tenths, so I do not think these values are equivalent. Make a model of each decimal on the grids to check your work.”



“We were right! The fractions $\frac{5}{10}$ and $\frac{5}{100}$ are not equivalent. Your model of five-tenths has a lot more shaded in than your model of five-hundredths.”

Representing Equivalent Decimals

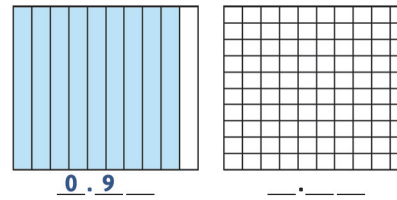
Clear the *Tenths and Hundredths Grids*. Write 0.9 at the bottom of the grid, which is divided into tenths.

“What decimal did I write?” *Zero and nine-tenths.*

New Teaching

(continued)

“Right! Nine-tenths of the sea turtles from the hatched nest reached the sea. Use the tenths grid to represent nine-tenths.”



“How many hundredths are equivalent to nine-tenths? Write the decimal, and read the value aloud.” (*Answer: 0.90, zero and ninety-hundredths*)

If your student is unsure, have him use the hundredths grid to make a model. Tell him to shade the hundredths grid so that the same amount is represented as in the tenths grid.



“That’s right! How did you figure that out?” *Each tenth is made up of ten hundredths. So, I multiplied 9 by 10 and got 90. To make the decimal equivalent, I made sure that each number had the same number of tenths, so I placed the nine in the tenths place. Then, I added a zero in the hundredths place.*

Have your student continue to practice identifying and representing equivalent decimals. If needed, have him use the *Tenths and Hundredths Grids*.

Provide the following pairs of fractions. Have your student write each fraction as a decimal, then determine if the pair is equivalent and explain how he knows.

- $\frac{8}{10}$ and $\frac{8}{100}$ (*Answer: 0.8 and 0.08; These are not equivalent because eight-hundredths is only eight small squares on the grid, and eight-tenths is almost a full grid.*)
- $\frac{2}{10}$ and $\frac{20}{100}$ (*Answer: 0.2 and 0.20; These are equivalent because each tenth is made up of ten hundredths, so two-tenths is the same as twenty-hundredths.*)

Provide the following fraction-and-decimal pairs. Have your student determine if each pair is equivalent and explain how he knows.

- 0.70 and $\frac{7}{10}$ (*Answer: These are equivalent because seven-tenths broken into hundredths makes seventy-hundredths.*)
- 0.3 and $\frac{3}{100}$ (*Answer: These are not equivalent because one is three-tenths, and the other is three hundredths. Three-tenths can be represented by three rods or three shaded columns, while three-hundredths is just three units or three shaded squares.*)

Complete Activity Sheet

“Let’s practice identifying and representing equivalent decimals!”

Model	Fraction	Decimal
	$\frac{4}{10}$	0.3
	$\frac{90}{100}$	0.09
	$\frac{20}{100}$	0.2
	$\frac{7}{10}$	0.07
	$\frac{3}{10}$	0.40
	$\frac{80}{100}$	0.70
	$\frac{7}{10}$	0.40
	$\frac{7}{10}$	0.40
	$\frac{7}{10}$	0.40
	$\frac{7}{10}$	0.40

Off to the Sea

Remove page 135 from the *Swoop into Math!* activity book. Cut apart the cards that are on the side of the table.

Have your student use the information provided in each row of the table to find the two remaining matches and then glue them in the correct column. Each set of matches, or each row, will include a model, a fraction, and a decimal that all represent the same amount. Not all the cards will be used.

Answer Key

Model	Fraction	Decimal
	$\frac{4}{10}$	0.40
	$\frac{90}{100}$	0.90
	$\frac{20}{100}$	0.2
	$\frac{7}{10}$	0.70
	$\frac{3}{10}$	0.3
	$\frac{80}{100}$	0.80



Look For

Your student might think that the decimals with zero-tenths and some hundredths are also equivalent to the given fraction or decimal.

Here’s How to Help: Have him make a model or use the base-10 blocks to represent the decimals and the fractions.

New Teaching (continued)

Math Reflection

“Let’s Reflect!”

Ask some questions to guide your student’s reflection:

- “How can you decide if two decimals are equivalent?”
- “If you add a zero after the last digit in a decimal, does it change the value of the decimal?”
- “What is one thing that you found difficult at first but that got easier as we practiced?”

Extended Practice (Optional)

If your student is not able to identify equivalent tenths and hundredths, or he expressed the need for more practice, continue working on this skill.

Have your student use the base-10 blocks or the *Tenths and Hundredths Grids* to model each number in the following pairs of numbers to help determine whether the pair is equivalent:

- 0.03 and $\frac{3}{10}$ (*Answer: not equivalent*)
- $\frac{5}{10}$ and $\frac{50}{100}$ (*Answer: equivalent*)
- 0.8 and 0.80 (*Answer: equivalent*)

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

Mark the Daily Review Tracker

Date	Skill	Assess and Model	Review
	Identify equivalent fractions	<input type="checkbox"/>	<input type="checkbox"/>
	Convert fractions to decimals	<input type="checkbox"/>	<input type="checkbox"/>
	Convert decimals to fractions	<input type="checkbox"/>	<input type="checkbox"/>
	Add and subtract fractions	<input type="checkbox"/>	<input type="checkbox"/>
	Multiply and divide fractions	<input type="checkbox"/>	<input type="checkbox"/>
	Add and subtract decimals	<input type="checkbox"/>	<input type="checkbox"/>
	Multiply and divide decimals	<input type="checkbox"/>	<input type="checkbox"/>
	Order fractions and decimals	<input type="checkbox"/>	<input type="checkbox"/>

Write today’s date next to the skill: Understand decimals expressed through hundredths. Include this in your rotation of daily review items.

Hatch a Match

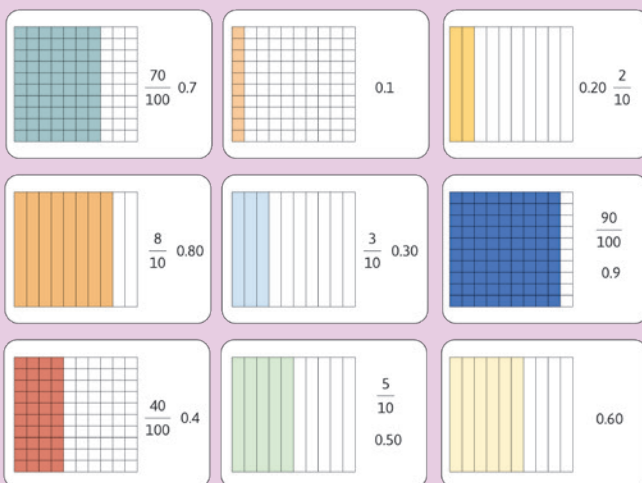
“Let’s practice our math skills!”

Materials

Hatch a Match Cards, *Swoop into Math!* pages 137 to 139

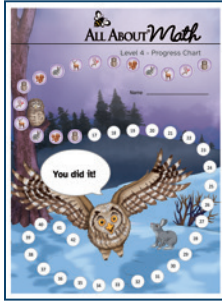
Directions

1. Cut apart the *Hatch a Match* cards. Sort the cards into three stacks depending on the way the number is represented (fraction, decimal and sea turtles, or grid), and mix the cards within each stack.
2. Deal two cards from each stack to each player. Then, mix the remaining cards together and place them face down in one stack. The players take turns flipping over the top card on the stack.
3. Both players look at the cards to see if they have a decimal, a fraction, or a model equivalent to the card. If a sea turtle card is flipped, the player who flipped it gets to call the number.
4. If either player can identify an equivalent match, he will read the value aloud and show the other player his card. If the card’s values are equivalent, that player puts his card in front of him, turtle side up, to “hatch” his turtle. The card that was flipped over should be placed in a discard pile.
5. If a player has more than one card that shows an equivalent value, he can place all the cards in front of him and “hatch” multiple turtles.
6. If a player has a sea turtle card, he can choose any decimal to play at any time in the game.
7. The first player to hatch all his turtles is the winner!



Track Your Progress

Mark the Progress Chart



Have your student mark Lesson 16 on the Progress Chart.



You're going on a road trip—cross country!

You'll be having some serious adventures
as you learn about math—hiking in the mountains
and visiting canyons, a waterfall, and a beach—and
guess whoooooo couldn't be happier for you?

Me!

Owl be thinking of you!



Lesson 26 Dividing Multi-Digit Numbers

Objective

Your student will learn to find whole-number quotients using partial quotient division.

You Will Need

- Swoop into Math!* pages 227 to 232
- dry-erase board, pocket, and marker
- Partial Quotient Division Mat, *Oxley's Math Tools* page x
- Base-10 Blocks (optional)
- Multiplication Table, *Oxley's Math Tools* (optional)
- blank sheet of paper

Math Vocabulary

partial quotient division, dividend, divisor, division bar

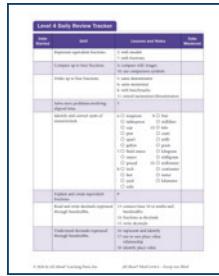
Before You Begin

Preview Partial Quotient Division

In this lesson, your student will build on his understanding of multiplication and division by learning how to use partial quotient division to divide multi-digit numbers without remainders.

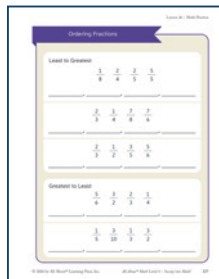
Partial quotient division is an alternative approach to long division. With this approach, your student will break apart a large division problem into a series of easier subtractions. He will repeatedly subtract easy multiples of the divisor (like 100 or 10) from the dividend, jotting down each partial quotient as he goes. When he can't subtract anymore, he will add those partial quotients together to get the final answer, with any leftover amount becoming the remainder. This flexible approach will build number sense and confidence because your student will be able to choose multiples that make sense to him rather than following a rigid long-division template.

Previously, your student used base-10 blocks and diagrams to model division problems. He created equal groups by dividing the tens and then the ones. He also explored how division and multiplication are connected, and he used a *Multiplication Table* as a helpful tool. Those earlier strategies—especially the step-by-step process of grouping tens and ones—will support his understanding of the multiple steps involved in partial quotient division.



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 227 in the *Swoop into Math!* activity book.

“Let’s practice ordering fractions. Write each set of fractions in order from either least to greatest or greatest to least.”

Answer Key

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

Dividing Larger Numbers Within 100

“Now, you are going to review dividing by using either your base-10 blocks or a drawing.”

Place the blank sheet of paper into the dry-erase pocket. Write $64 \div 4 = \underline{\quad}$ on the dry-erase board.

“Use your base-10 blocks or a drawing to solve this division problem.”

“What is the quotient of $64 \div 4$?” *Sixteen.*

“Yes. Explain how you found your answer.” *First, I used the base-10 blocks to model the number 64. Then, I drew 4 boxes to represent 4 groups. I put 1 rod in each of the boxes. Since I could not add another rod to each of*

Review (continued)

the boxes equally, I exchanged 2 rods for 20 unit cubes. I added those to the 4 unit cubes I had before and equally divided the 24 unit cubes into the boxes.



“Good. Let’s build on what you already know to learn a new way to divide.”

New Teaching

Partial Quotient Division

“Let’s imagine that we are volunteering at our local petting zoo. We have to help the animal caretakers get ready for a big day at the petting zoo! They need to feed the animals and give them toys and snacks.”

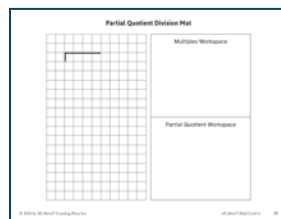
“Previously, you used base-10 blocks and drawings to divide two-digit numbers. Today, you’ll learn a new strategy called partial quotient division. **Partial quotient division** makes it easier to divide larger numbers in an organized way.”

“The animal caretakers need your help to give fresh timothy hay to hungry rabbits. The petting zoo has 4 rabbits and 64 ounces of timothy hay. We need to find out how many ounces of timothy hay each rabbit will get.”

Write $64 \div 4 = \underline{\quad}$ on the dry-erase board.

“First, let’s take a look at the numbers in a division problem. This number (point to the 64) is called the dividend. The **dividend** is the number that we will divide into smaller groups.”

“This next number (point to the 4) is called the divisor. The **divisor** tells us either how many groups there are or how many items are needed in each group.”



Partial Quotient Division Mat

Find the *Partial Quotient Division Mat* from *Oxley’s Math Tools* on page x. Place it into the dry-erase pocket.

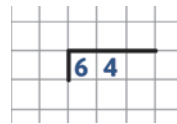
New Teaching

(continued)

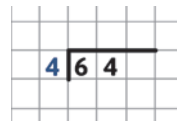
“Now, we will solve this problem using the *Partial Quotient Division Mat*. This mat will help you stay organized when dividing larger numbers.”

Point to the division bar on the *Partial Quotient Division Mat*. “This is called a division bar. It looks like a corner of a box. The **division bar** separates the dividend and divisor in partial quotient division.”

“Let’s set up the division problem by using our *Partial Quotient Division Mat*. First, we need to write the dividend. In this problem, the dividend is 64. This is the number of ounces of fresh timothy hay that we need to divide equally into groups. I will write 64 under the division bar.”



“Next, we need to write the divisor. The divisor is 4, which is how many groups we are dividing 64 into. I will write the 4 next to the division bar.”



“Now, we are ready to divide by using partial quotient division.”

Your student can use his *Multiplication Table* during this lesson to help determine what to multiply the divisor by.



“When we did this with the blocks, we put the rods into equal groups first. What does a rod equal?” *Ten.*

“Right. A rod equals 10, so let’s think about multiples of 10 first. Multiples of 10, like 10, 20, 30, or 40, are easy numbers to multiply. The divisor is 4, so let’s start with 4×10 and 4×20 . I will write the equations in the Multiples Workspace section on your *Partial Quotient Division Mat*, and you write the products.” (*Answers: $4 \times 10 = 40$ and $4 \times 20 = 80$*)

“When we divide by using partial quotient division, we need to think about how we can multiply the divisor to get as close as we can to

New Teaching (continued)

64 without going over. I know that 4×20 is 80, which is too much, so I'm going to use 4×10 . I will write 40 under the 64 and 4×10 next to the 40."

Multiples Workspace

"Forty is not as much as 64, though, so we have only divided part of the number. We need to subtract the 40 from 64 to see how much is left that we still need to divide. What is $64 - 40$?" *Twenty-four.*

Multiples Workspace

"Yes. Now, what do you know about 4 and 24?" *I know that 4×6 equals 24.*

"Good. I will write 24 under the 24, and I will write 4×6 next to it. What is $24 - 24$?" *Zero.*

Multiples Workspace

"Nice. Since the answer is zero, we are done dividing. So now, let's add up the numbers that we multiplied by four. First, we multiplied by ten, and then we multiplied by six. Let's add those two together. You can use the Partial Quotient Workspace to add the numbers together. What is $10 + 6$?" *Sixteen.*

"Good. This means that 64 divided by 4 equals 16. Each rabbit will get 16 ounces of timothy hay. When we finish dividing, we write the quotient on top of the division bar." Write 16 on top of the division bar.

Multiples Workspace

$4 \times 10 = 40$
 $4 \times 20 = 80$

Partial Quotient Workspace

$10 + 6 = 16$

Clear the *Partial Quotient Division Mat*.

Dividing Three-Digit Numbers by Using Partial Quotient Division

“Let’s move on to a bigger job. There are 168 mealworms, and each hedgehog will get 6 mealworms added to their food. Let’s find out how many hedgehogs are at the petting zoo.”

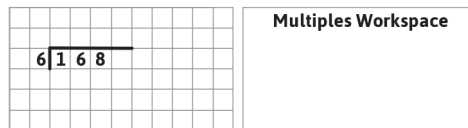
Write $168 \div 6 = \underline{\quad}$ on the dry-erase board.

“The way that we divide three-digit numbers is just like how we divide two-digit numbers. Let’s begin by using the *Partial Quotient Division Mat* to set up the problem.”

“First, you need to write the dividend. What is the dividend in this problem?” *One hundred sixty-eight.*

“Yes. Write 168 under the division bar.”

“Next, write the divisor on the *Partial Quotient Division Mat*.” (*Answer: 6*)



“What is our first step?” *We need to think about what we can multiply by 6 by to get close to 168 without going over.*

“Yes. We can use multiples of ten to make it easier.” Write 6×10 , 6×20 , and 6×30 on the mat, and have your student find the products. (*Answers: 60, 120, 180*)

“Good. This will make dividing easier. Which multiple do you think we should use first?” Allow your student to decide which multiple he would like to work with.

Your student might choose a multiple of the divisor that is much smaller than the dividend. This is actually okay and is one of the advantages of partial quotient division. If he has to take away 6×10 twice instead of starting with 6×20 , he will add those two tens together at the end and still get the correct answer. Continue working with your student to write a list of easy numbers to help him decide the best number to start with, but know that it’s okay if he chooses a low number sometimes.



“Nice choice. The product 120 does not go over 168. So, what is the next step?” *I will write 120 under 168 and write 6×20 next to 120. Then, I will subtract to find the difference.*

New Teaching (continued)

“Good. What is $168 - 120$, and what should we do next?” *The difference is 48. We need to think about what we can multiply 6 by to get close to 48 without going over.*

$\begin{array}{r} 6 \overline{) 168} \\ - 120 \\ \hline 48 \end{array}$	6×20
---	---------------

Multiples Workspace	
$6 \times 10 = 60$	
$6 \times 20 = 120$	
$6 \times 30 = 180$	

“That’s right. What multiplication fact can help us find out how many groups of 6 are in 48?” *I know that 6×8 equals 48.*

“Good. What do we need to do?” *Write $- 48$ under 48 and write 6×8 next to it.*

“So, $48 - 48$ equals 0, which means that we are done dividing!”

“Now, let’s add up the numbers that we multiplied by six. We multiplied 6×20 and 6×8 . Let’s add $20 + 8$ together. What is the sum?” *Twenty-eight.*

$\begin{array}{r} 28 \\ 6 \overline{) 168} \\ - 120 \\ \hline 48 \\ - 48 \\ \hline 0 \end{array}$	6×20 6×8
---	-----------------------------------

Multiples Workspace	
$6 \times 10 = 60$	
$6 \times 20 = 120$	
$6 \times 30 = 180$	

Partial Quotient Workspace	
$20 + 8 = 28$	

“Well done! You divided 168 mealworms into groups of 6 for 28 hedgehogs. That’s because $168 \div 6 = 28$.”

“The zookeeper gave us 177 snack buckets to share evenly among 3 animal pens. Each pen should get the same number of buckets. Write the dividend and the divisor on your *Partial Quotient Division Mat*.”

“Before you start dividing, write some multiples of 10 that can help you. Start with 3×10 , and keep going until you get close to 177.” (*Answer: $3 \times 10 = 30$, $3 \times 20 = 60$, $3 \times 30 = 90$, $3 \times 40 = 120$, $3 \times 50 = 150$, $3 \times 60 = 180$*)

“Which multiple gets close to 177 but doesn’t go over?” $3 \times 50 = 150$.

“Nice choice! Let’s use that one. Write 3×50 on your *Partial Quotient Division Mat* and subtract 150 from 177 to see how many snack buckets are left.” (*Answer: $177 - 150 = 27$*)

“How many snack buckets do we still need to pass out?” *Twenty-seven.*

“Good. What multiple of 3 can we use to get close to 27?” $3 \times 9 = 27$.

New Teaching (continued)

“Yes. Write that one down and subtract. What’s left?” *Zero.*

“No snack buckets left means we have divided them evenly. Let’s find the total number of buckets each pen gets by adding up the partial quotients.” (*Answer: $50 + 9 = 59$*)

“So, each pen gets 59 snack buckets.”

$\begin{array}{r} 59 \\ 3 \overline{)177} \\ - 150 \\ \hline 27 \\ - 27 \\ \hline 0 \end{array}$	3×50 3×9
Multiples Workspace	
$3 \times 10 = 30$ $3 \times 20 = 60$ $3 \times 30 = 90$ $3 \times 40 = 120$ $3 \times 50 = 150$ $3 \times 60 = 180$	
Partial Quotient Workspace	
$50 + 9 = 59$	

Have your student practice using the partial quotient division approach to solve the following problems by using the *Partial Quotient Division Mat*:

- $95 \div 5 = \underline{\quad}$ (*Answer: 19*)
- $144 \div 4 = \underline{\quad}$ (*Answer: 36*)
- $234 \div 9 = \underline{\quad}$ (*Answer: 26*)

Complete Activity Sheet

Feeding Time at the Petting Zoo

Turn to pages 229 and 230 in the *Swoop into Math!* activity book.

“The animal caretakers have a few more animals that need their meals.”

Have your student find the quotient for each division problem by using the partial quotient division approach. He can use the *Multiplication Table* to help him solve each problem, if needed. Choose one problem for him to explain which numbers are the dividend, divisor, and quotient.

Answer Key

Your student may choose different multiples of 10 when dividing. As long as he reaches the same final quotient, the exact partial quotients he uses will not matter. For example, when solving $459 \div 9$, he might use 9×10 five times instead of 9×50 . Both methods show the same understanding of division.

New Teaching (continued)

$$\begin{array}{r} 23 \\ 3 \overline{) 69} \\ \underline{-60} \quad 3 \times 20 \\ 9 \\ \underline{-9} \quad 3 \times 3 \\ 0 \end{array}$$

$$\begin{array}{r} 22 \\ 6 \overline{) 132} \\ \underline{-120} \quad 6 \times 20 \\ 12 \\ \underline{-12} \quad 6 \times 2 \\ 0 \end{array}$$

$$\begin{array}{r} 12 \\ 9 \overline{) 108} \\ \underline{-90} \quad 9 \times 10 \\ 18 \\ \underline{-18} \quad 9 \times 2 \\ 0 \end{array}$$

$$\begin{array}{r} 22 \\ 5 \overline{) 110} \\ \underline{-100} \quad 5 \times 20 \\ 10 \\ \underline{-10} \quad 5 \times 2 \\ 0 \end{array}$$

$$\begin{array}{r} 51 \\ 9 \overline{) 459} \\ \underline{-450} \quad 9 \times 50 \\ 9 \\ \underline{-9} \quad 9 \times 1 \\ 0 \end{array}$$

$$\begin{array}{r} 45 \\ 5 \overline{) 225} \\ \underline{-200} \quad 5 \times 40 \\ 25 \\ \underline{-25} \quad 5 \times 5 \\ 0 \end{array}$$



Look For

Your student might choose a multiple of the divisor that is larger than the remaining dividend.

Here's How to Help: Have your student use the *Partial Quotient Division Mat* to write a few multiples of ten times the divisor. Then, have him talk through which ones will work and which ones are too large.

Math Reflection

“Let’s Reflect!”

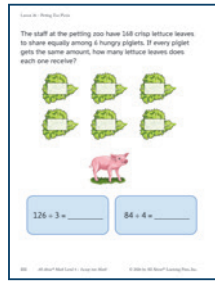
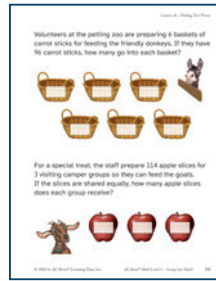
Ask some questions to guide your student’s reflection:

- “Can you explain what the divisor and the dividend are?”
- “How can you use multiplication to help you with partial quotient division?”
- “How can using multiples of ten help you with partial quotient division?”

Extended Practice (Optional)

If your student is struggling to divide by using partial quotient division, or he expressed the need for more practice, continue working on this skill.

New Teaching (continued)



Petting Zoo Picnic

Turn to pages 231 and 232 in the *Swoop into Math!* activity book.

Have your student begin by using base-10 blocks to model each problem. Use the baskets, apples, or lettuces in the pictures to help

him divide the blocks into equal groups. For example, if he is dividing 96 carrot sticks into 6 baskets, have him use the blocks to make 6 equal groups. When he finds the answer (in this case, 16 each), then he can write the number on each basket to represent the number of blocks (carrot sticks).

After modeling with the blocks, have him use the *Partial Quotient Division Mat* to solve the same problem on paper. The divided blocks will help him see how the numbers connect to the steps on the mat.

For the two problems on the bottom of the second page, have your student start with the *Partial Quotient Division Mat* first to find the quotient. Then, he can use the base-10 blocks to check his work, showing that his answer makes equal groups.

Answer Key

16 carrot sticks, 38 apple slices, 28 lettuce leaves, 42, 21

Your student will continue to divide two- and three-digit numbers in future lessons. You can proceed to the next lesson without full mastery of this skill.

Mark the Daily Review Tracker

Write today's date next to the skill: Find whole-number quotients with multi-digit dividends. Include this in your rotation of daily review items.

Petting Zoo Division Mission

“Let’s practice our math skills!”

Materials

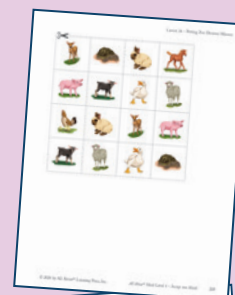
- Petting Zoo Division Mission Cards, *Swoop into Math!* pages 233 and 234
- Petting Zoo Division Mission Gameboards, *Swoop into Math!* pages 235 and 236
- Partial Quotient Division Mat, *Oxley's Math Tools*
- dry-erase pocket and marker

Directions

1. Cut out the *Petting Zoo Division Mission* cards, and then scatter them around the workspace with the animal side up. Place one *Petting Zoo Division Mission* gameboard between the players. You have two gameboards to choose from.
2. Place the *Partial Quotient Division Mat* inside the dry-erase pocket.
3. Player 1 chooses a card and flips it over to reveal a division problem. He solves the problem using partial quotient division. Player 2 checks his work.
4. If the answer is correct, both players check their gameboards for the quotient. If it appears, that player gets to add the animal to his petting zoo (gameboard) and put it on top of that number. If the quotient is not on the gameboard, put the card on a discard pile. If the answer is incorrect, the card is returned to the pile and mixed back in.
5. Player 2 then takes a turn choosing a new card, solving the problem, and having Player 1 check his work. Continue taking turns until all the problems are solved or the gameboard is full.
6. The first player to fill his petting zoo (has all the quotients covered with animals) is the winner!

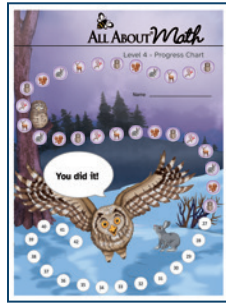
Answer Key

A: 31, B: 72, C: 63, D: 14, E: 23, F: 91, G: 22, H: 12, I: 13, J: 42, K: 43, L: 13, M: 16, N: 47, O: 11, P: 24

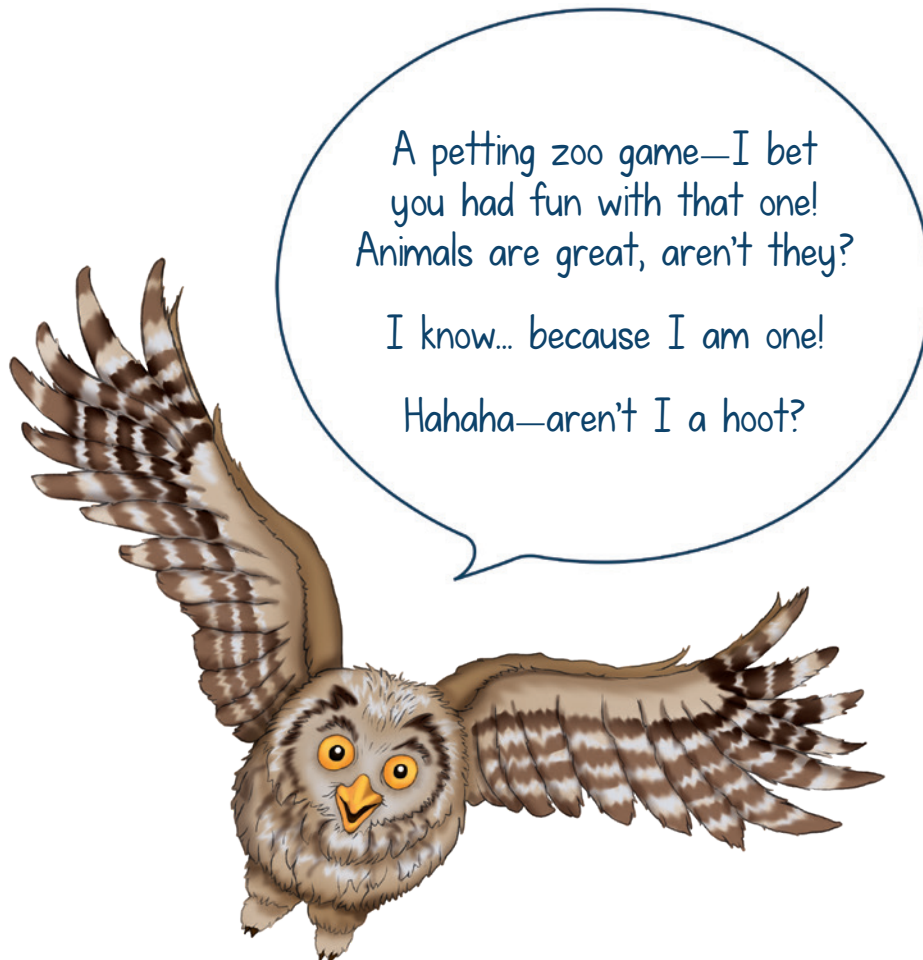


Track Your Progress

Mark the Progress Chart



Have your student mark Lesson 26 on the Progress Chart.



Lesson 34 Show What You Know! 3: Partial Products and Quotients, Fraction Sums and Differences

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

- Swoop into Math!* pages 297 to 301
- Tenth and Hundredths Grids, *Oxley's Math Tools*
- dry-erase board, pocket, and marker
- Tenth and Hundredths Number Lines, *Oxley's Math Tools*
- Decimal Place Value Chart, *Oxley's Math Tools*
- Fraction Models, *Oxley's Math Tools* (optional)
- Multiplication Table, *Oxley's Math Tools* (optional)
- Partial Quotient Division Mat, *Oxley's Math Tools* (optional)
- Fractions and Decimals Mat, *Oxley's Math Tools*
- Classifying Shapes Cards, *Oxley's Math Tools*
- Units of Measurement Cards, *Oxley's Math Tools* (optional)

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, there is a chart that helps you know what lessons to review if that happens.

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

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

Progress Monitoring

“You worked really hard learning about multiplying and dividing whole numbers, and adding and subtracting fractions. 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.”

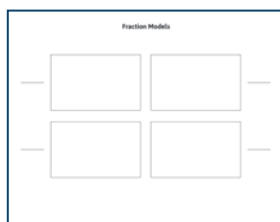
“Let’s show what you know!”



Show What You Know! 3

Turn to page 297 in the *Swoop into Math!* activity book for questions 1 to 5.

Question 1



Fraction Models

Find the *Fraction Models* from *Oxley’s Math Tools*. Place it into the dry-erase pocket with the rectangles side up.

Write $\frac{2}{8}$ and $\frac{5}{8}$ on the dry-erase board.

Leave space between the fractions for your student to write a comparison symbol.

“What do you notice about these two fractions?” *The denominators are the same.*

“That’s right. Place a comparison symbol between the two fractions. Use the *Fraction Models* to help you, if you’d like.” (*Answer: <*)

“Which symbol did you choose? How did you know that was the correct symbol?” *I chose the less than symbol. Since the denominators are the same, I compared the numerators, and two is less than five. I made a model of $\frac{2}{8}$ and $\frac{5}{8}$. Two-eighths is smaller.*

Do not clear the dry-erase board. Write $\frac{3}{5}$ and $\frac{3}{6}$ under the previous comparison statement with a space between them.

“What do you notice about these fractions that is different from the previous two fractions you compared?” *The denominators are different. The numerators are the same.*

Progress Monitoring

(continued)

“Good! Decide which comparison symbol to use to make the statement true. Then, tell me how you decided. Use the *Fraction Models* to help you, if you’d like.” (Answer: $>$) *Since they have the same numerator, I compared the denominators. A fifth is larger than a sixth. I made a model to show the comparison. I know three-sixths is the same as one-half, and three-fifths is more than one-half.*

Do not clear the dry-erase board. Write $\frac{2}{3}$ and $\frac{7}{12}$ on the board under the previous comparison statements.

“What do you notice about the numerators and the denominators in these two fractions compared to the others that you compared?” *They do not have the same numerator or denominator.*

	0	1	2	3	4	5	6	7	8	9	10	11	12
0													
1													
2													
3													
4													
5													
6													
7													
8													
9													
10													
11													
12													

Multiplication Table

Find the *Multiplication Table* from *Oxley's Math Tools*. Have it available for your student to use, if needed.

“That’s right. Remember that you can find a common denominator to help you compare fractions when they have unlike denominators. Write the comparison symbol needed to compare these two fractions. Then, tell me how you decided.” (Answer: $>$) *I found a common denominator of 12 and rewrote two-thirds as eight-twelfths. Since both fractions then had the same denominator, I compared the numerators. Eight is larger than seven.*

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

Question 2

“We can use the same observations about numerators and denominators to help us order a group of fractions.”

Write $\frac{4}{10}$, $\frac{9}{10}$, $\frac{2}{10}$, $\frac{12}{10}$ on the dry-erase board.

“Order these fractions from least to greatest. Use the *Fraction Models* to help you, if you would like.” (Answer: $\frac{2}{10}$, $\frac{4}{10}$, $\frac{9}{10}$, $\frac{12}{10}$)

Clear the dry-erase board and write $\frac{3}{8}$, $\frac{3}{3}$, $\frac{3}{4}$, $\frac{3}{10}$.

“This time, order the fractions from greatest to least. Use the *Fraction Models* to help you, if you would like.” (Answer: $\frac{3}{3}$, $\frac{3}{4}$, $\frac{3}{8}$, $\frac{3}{10}$)

Clear the dry-erase board and write $\frac{3}{8}$, $\frac{5}{4}$, $\frac{1}{2}$, $\frac{3}{4}$.

Progress Monitoring
(continued)

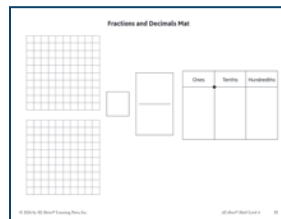
“Order these fractions from least to greatest. Use the *Fraction Models* to help you, if you would like.” (*Answer: $\frac{3}{8}, \frac{1}{2}, \frac{3}{4}, \frac{5}{4}$*)

“How did you decide that $\frac{3}{8}$ has the least value?” *It was the only fraction less than one-half. I found a common denominator of eight and compared the numerators of all the fractions.*

“How did you decide that $\frac{5}{4}$ has the greatest value?” *It was the only fraction greater than one whole.*

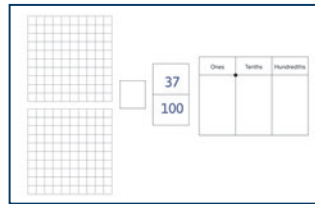
Circle your observations in question number 2. Clear the dry-erase board and pocket.

Question 3

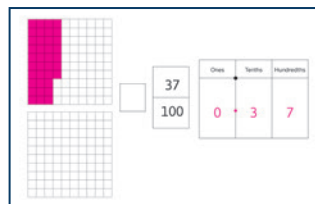


Fractions and Decimals Mat

Find the *Fractions and Decimals Mat* from *Oxley's Math Tools*. Place this page into the dry-erase pocket. Write the fraction $\frac{37}{100}$.

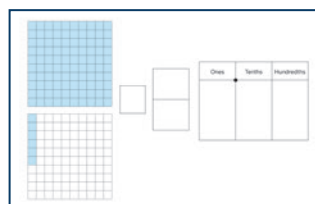


“Let’s review what we know about decimals. Represent this fraction by shading in the grid and then writing the value as a decimal.”



“What value is represented?” *Zero and thirty-seven hundredths.*

Clear the dry-erase pocket. Shade in $1\frac{6}{100}$ on the grids.

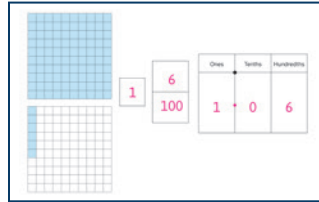


Progress Monitoring
(continued)

“How much have I shaded on the grids?” *One and six-hundredths.*

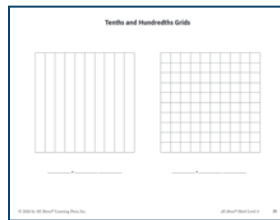
“Right! We can represent this value as a mixed number and as a decimal. Write both representations on the *Fractions and Decimals Mat.*”

Answer Key



Circle your observation in question number 3. Clear the dry-erase pocket.

Question 4



Tenths and Hundredths Grids

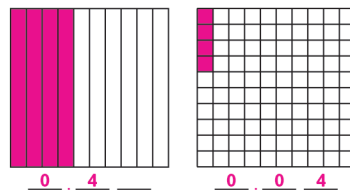
Find the *Tenths and Hundredths Grids* from *Oxley's Math Tools*. Place it into the dry-erase pocket.

Write the numbers 0.4 and $\frac{4}{100}$ on the

dry-erase board.

“Evie thinks these two values are equivalent. Do you agree or disagree with Evie? Support your answer by writing each value as a decimal and by making a model of each value on the *Tenths and Hundredths Grids.*”
I disagree with Evie.

Answer Key



“Write the fraction and the decimal that is equivalent to 0.4.”

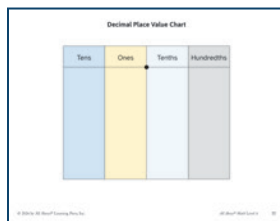
(Answer: $\frac{4}{10}$ or $\frac{40}{100}$, 0.4 or 0.40)

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

Progress Monitoring

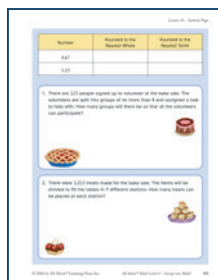
(continued)

Question 5



Decimal Place Value Chart

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



Lesson 34 - Activity Page

Turn to page 301 in the *Swoop into Math!* activity book. You will use the chart at the top for this question.

“We can round decimals to help us estimate. Fill in the table by rounding each number to the nearest whole and the nearest tenth.”

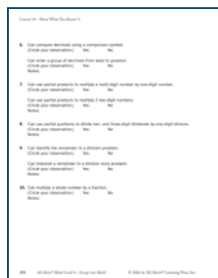
Answer Key

Number	Rounded to the Nearest Whole	Rounded to the Nearest Tenth
0.67	1	0.7
5.23	5	5.2

Circle your observations in question number 5. Clear the dry-erase pocket.



You can take a short break, if needed.

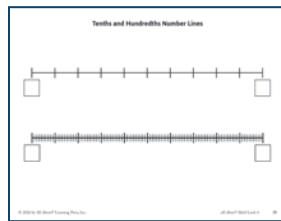


Show What You Know! 3

Turn to page 298 in the *Swoop into Math!* activity book for questions 6 to 10.

**Progress
Monitoring**
(continued)

Question 6



Tenths and Hundredths Number Lines

Find the *Tenths and Hundredths Number Lines* from *Oxley's Math Tools*. Place this page into the back of the dry-erase pocket, behind the *Decimal Place Value Chart*.

Write the decimals 0.51 and 0.8 on the dry-erase board. Leave space between the decimals for your student to write a comparison symbol.

“Write a comparison symbol between the two decimals to make the statement true. You can use the *Tenths and Hundredths Number Lines* or the *Decimal Place Value Chart* to help you, if you'd like.” (*Answer: <*)

“Which symbol did you choose, and why?” *I chose the less than symbol because fifty-one hundredths has only five tenths, and eight-tenths has eight.*

Clear the dry-erase board. Write the decimals 3.2, 3.41, 3.02, 3.5.

“Rewrite these decimals in order from least to greatest. Use the *Tenths and Hundredths Number Lines* or the *Decimal Place Value Chart* to help you, if you like.” (*Answer: 3.02, 3.2, 3.41, 3.5*)

Circle your observations in question number 6. Clear the dry-erase board and pocket.

Question 7

On the dry-erase board, write the equation $7,492 \times 3 = \underline{\quad}$.

“Use partial products to help you find the product. You can use the *Multiplication Table* or the *Partial Division Quotient Mat* to help you, if needed.” (*Answer: 22,476*)

	7,000	+	400	+	90	+	2	
3	21,000	1,200	270	6				
	21,000	1,200	270	6				
		+	6					
		22,476						

Clear the dry-erase board. Write $36 \times 45 = \underline{\quad}$.

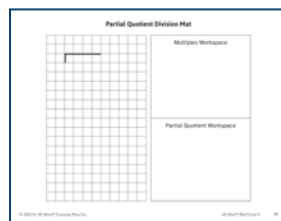
Progress Monitoring
(continued)

“We can also use partial products to multiply 2 two-digit numbers. Use the dry-erase board to set up your partial products model, and then find the answer.” (*Answer: 1,620*)

		40 + 5		
30	1,200	150	+1	1,200
+			150	240
6	240	30	+ 30	<u>1,620</u>

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

Question 8



Partial Quotient Division Mat

Find the *Partial Quotient Division Mat* from *Oxley's Math Tools*. Place this page into the dry-erase pocket.

Write $51 \div 3 = 17$ on the dry-erase board.

“We learned some new terms for the parts of a division equation. Circle the quotient in this equation and tell what it represents in an equation.” Your student should draw a circle around 17. (*Answer: It is the answer when you divide.*)

“That’s right! We also learned that the dividend is the number that is being divided. Draw a square around the dividend in this equation.” Your student should draw a square around 51.

“The divisor in this equation is three. What does the divisor represent in a division equation?” *The number of groups. The amount being divided by.*

Clear the dry-erase board. Write $68 \div 2 = \underline{\quad}$.

“For the following division equations, you can use the *Multiplication Table* to help you, if needed. Find the quotient.” The partial quotients and the number of steps that your student uses to find the answer might differ from those in the example for this and other division problems below, but he should still get 34 as the quotient. (*Answer: 34*)

$2 \overline{) 68}$	$\frac{34}{-20}$	2×10	10
	$\frac{48}{-40}$	2×20	20
	$\frac{8}{-8}$	2×4	$+ 4$
	$\frac{0}{0}$		$\frac{34}{34}$

**Progress
Monitoring**
(continued)

Clear the dry-erase board. Write the equation $765 \div 5 = \underline{\quad}$.

“Find the quotient.” (*Answer: 153*)

$$\begin{array}{r}
 153 \\
 5 \overline{) 765} \\
 \underline{-500} \quad 5 \times 100 \quad 100 \\
 265 \\
 \underline{-250} \quad 5 \times 50 \quad 50 \\
 15 \\
 \underline{-15} \quad 5 \times 3 \quad \underline{+ 3} \\
 0 \\
 \underline{\quad} \quad \underline{\quad} \quad 153
 \end{array}$$

Circle your observation in question number 8. Clear the dry-erase board and pocket.

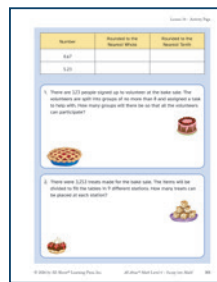
Question 9

Write the equation $2,846 \div 4 = \underline{\quad}$ on the dry-erase board.

“This time, we have a four-digit dividend. Find the quotient. Then, tell me how you found your answer. You can use the *Multiplication Table* or the *Partial Division Quotient Mat* to help you, if needed.” (*Answer: 711 R2*)

$$\begin{array}{r}
 711 \text{ R}2 \\
 4 \overline{) 2,846} \\
 \underline{-2,800} \quad 4 \times 700 \quad 700 \\
 46 \\
 \underline{-40} \quad 4 \times 10 \quad 10 \\
 6 \\
 \underline{-4} \quad 4 \times 1 \quad \underline{+ 1} \\
 2 \\
 \underline{\quad} \quad \underline{\quad} \quad 711 \text{ R}2
 \end{array}$$

“Your answer has a remainder! What does a remainder represent in a division problem?” *The remainder is the amount left over.*



Lesson 34 - Activity Page

Turn to page 301 in the *Swoop into Math!* activity book. The story problems for this question are listed there for your student to read aloud or to follow along as you read. He can also use the page to underline pertinent numbers, the question that needs to be answered, or anything else that he might find helpful.

“When solving a real-world problem with a remainder, we have to decide what to do with the remainder.”

Story problem #1: There are 123 people signed up to volunteer at the bake sale. The volunteers are split into groups of no more than 8 and assigned a task to help with. How many groups will there be so that all the volunteers can participate?

Progress Monitoring

(continued)



You can take a short break if needed.



Show What You Know! 3

Turn to page 299 in the *Swoop into Math!* activity book for questions 11 to 15.

Question 11

Write $\frac{5}{6} + \frac{2}{6} = \text{---}$ on the dry-erase board.

“Find the sum. Then, tell me how you found your answer.” *The sum is seven-sixths. I added the numerators together. I made a diagram to help me add.*

Clear the dry-erase board and write $2\frac{3}{12} + 3\frac{5}{12} = \text{---}$.

“Find the sum. Then, tell me how you found your answer.” *The sum is $5\frac{8}{12}$. First, I added the fractions, and three-twelfths plus five more twelfths is eight-twelfths. Then, I added the wholes, and two plus three equals five.*

Circle your observations in question number 11. Clear the dry-erase board.

Question 12

Write $\frac{13}{10} - \frac{2}{10} = \text{---}$ on the dry-erase board.

“Find the difference. Then, tell me how you found your answer.” *The difference is eleven-tenths. I subtracted the numerators.*

“I notice that your answer is an improper fraction. What makes a fraction an improper fraction?” *An improper fraction is when the numerator is greater than the denominator. That means the fraction represents more than one whole.*

Clear the dry-erase board and write $7\frac{2}{5} - 1\frac{1}{5} = \text{---}$.

“Find the difference.” *(Answer: $6\frac{1}{5}$)*

Clear the dry-erase board and write $4\frac{1}{4} - 2\frac{3}{4} = \text{---}$.

Progress Monitoring

(continued)

“Find the difference. How did solving this problem differ from solving the last problem?” *The difference is one and two-fourths. I had to decompose a whole to solve this problem.*

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

Question 13

Write $\frac{8}{10} + \frac{41}{100} = \underline{\hspace{2cm}}$ on the dry-erase board.

“Find the sum of these two fractions. Then, tell me how you found your answer.” *One hundred twenty-one hundredths. Since the denominators are different, I had to find an equivalent fraction. Eight-tenths is the same as eighty-hundredths. Then, I added the numerators together.*

“Vanessa added $\frac{72}{100}$ and $\frac{5}{10}$. She says that the sum is $\frac{77}{100}$. What mistake did Vanessa make, and what would you say to help her find the correct answer?” *She did not find a common denominator. I would tell her that she can't add the numerators yet, because the denominators are different. We know that five-tenths is the same as fifty-hundredths. So, we can add fifty-hundredths and seventy-two hundredths to get one hundred twenty-two hundredths.*

Circle your observation in question number 13. Clear the dry-erase board.

Question 14

Write 15 teaspoons = ___ tablespoons on the dry-erase board.

“Find how many tablespoons are equivalent to 15 teaspoons.”
(*Answer: Five.*)

“How did you know?” (*Answer: Three teaspoons are equivalent to 1 tablespoon. $15 \div 3 = 5$.*)

Write 8 quarts = ___ gallons on the dry-erase board.

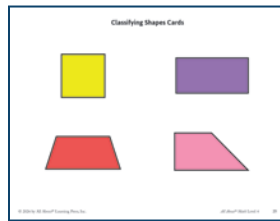
“Find how many gallons are equivalent to eight quarts.” (*Answer: Two gallons.*)

“How did you know?” (*Answer: One gallon is equivalent to four quarts. $8 \div 4 = 2$.*)

Circle your observation in question number 14.

Progress Monitoring (continued)

Question 15



Classifying Shapes Cards

Find the *Classifying Shapes Cards* from *Oxley's Math Tools*.

“Look at each *Classifying Shapes Card*, and sort the cards using the properties listed below.

After you finish each sort, gather all the cards back together and reshuffle before moving on to the next sort.”

The sorts:

- Has parallel lines/does not have parallel lines;
- Has perpendicular lines/does not have perpendicular lines;
- Has at least one obtuse angle/does not have obtuse angles;
- Has at least one right angle/does not have right angles; and
- Has at least one acute angle/does not have acute angles.

Answer Key

Parallel lines: rectangle, square, right trapezoid, trapezoid, parallelogram, rhombus, hexagon

Perpendicular lines: rectangle, square, right trapezoid, right triangle

At least one acute angle: right trapezoid, trapezoid, parallelogram, right triangle, rhombus, obtuse triangle, acute triangle, irregular hexagon

At least one right angle: rectangle, square, right trapezoid, right triangle

At least one obtuse angle: right trapezoid, trapezoid, parallelogram, rhombus, obtuse triangle, irregular hexagon, hexagon

Circle your observations in question number 15.

Math Reflection

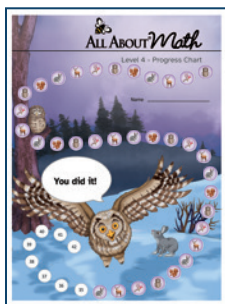
“Let’s Reflect!”

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 34 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 his skills. This is a great time to update your student's progress on his *Daily Review Tracker*.

Refer back 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 he might need extra help. Going over these challenging questions again gives him a chance to practice these skills.



Question 1: Comparing fractions	Lessons 4 and 10
Question 2: Ordering fractions	Lessons 5, 6, 8, and 11
Question 3: Relating fractions and decimals	Lessons 14 and 15
Question 4: Identifying equivalent fractions and decimals	Lesson 16
Question 5: Rounding decimals	Lesson 20
Question 6: Comparing and ordering decimals	Lessons 21 and 22
Question 7: Multiplying whole numbers	Lessons 24 and 25
Question 8: Dividing multi-digit numbers	Lesson 26

Skill Chart

(continued)

Question 9: Dividing with remainders	Lessons 27 and 28
Question 10: Multiplying fractions by a whole number	Lessons 29 and 30
Question 11: Adding fractions	Lesson 31
Question 12: Subtracting fractions	Lesson 32
Question 13: Adding tenths and hundredths	Lesson 33
Question 14: Converting measurements	Lessons 6, 7, 8, and 9
Question 15: Classifying shapes	Lessons 19 and 22

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.



I think this is going
to be my favorite lesson!

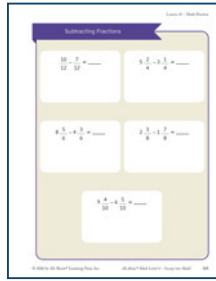
Know why? It's about stargazing!

Since I fly mostly at night,
stargazing is a favorite pastime of mine.
Stars are so fascinating!

Ow! be joining you in this lesson,
for sure!



Review (continued)



Math Practice

Turn to page 365 in the *Swoop into Math!* activity book.

“Let’s review subtracting fractions. Make a model to help you, if you’d like.”

Answer Key

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

Solving Story Problems

“Let’s review some of the strategies that we have learned for solving story problems.”

Discuss the different ways that your student can solve problems. If your student struggles to name ways to solve a problem, discuss the following strategies :

- Use a tape diagram to represent what is happening in the story problem.
- Draw a model to help visualize the parts of the story problem.
- Use manipulatives (base-10 blocks, connecting cubes, two-color counters, etc.) to represent the numbers in the story problem.
- Write an equation with a letter that represents the unknown number.

“You can use many strategies to help you make sense of a story problem. Let’s practice some of these strategies.”



Strategies for Solving Story Problems

Remove page 366 from the *Swoop into Math!* activity book.


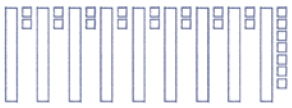
Read the story problem with your student, and then have her use the four strategies to find the answer. If she has forgotten how to use one of the strategies, review it with her by modeling it.

Review (continued)

After your student solves the problem using each strategy, discuss how the strategies are similar and different, and which makes the most sense to your student.

Have this page available for your student throughout the lesson so she can refer to it as needed.

Answer Key

Strategy	Work
tape diagram	 $\begin{array}{r} 12 \quad 12 \quad 12 \quad 12 \quad 12 \quad 12 \quad 12 \quad 12 \\ \hline 96 \quad 17 \end{array}$ $\begin{array}{r} 12 \quad 96 \\ \times 8 \quad + 17 \\ \hline 96 \quad 113 \end{array}$
drawing	 $\begin{array}{r} 9 \text{ tens} \\ 23 \text{ ones} \\ 90 \\ + 23 \\ \hline 113 \end{array}$
manipulatives	<ul style="list-style-type: none"> • 8 rows showing 1 rod and 2 units each • 1 row showing 1 rod and 7 units $\begin{array}{r} 90 \\ + 23 \\ \hline 113 \end{array}$
equation	$\begin{array}{l} 12 \times 8 = g \\ g + 17 = t \\ 96 + 17 = 113 \end{array}$

New Teaching

Solving Story Problems with Multiple Operations

“Let’s imagine that we will spend the day at the arcade! We’ll purchase tokens, play games, and win prizes! While we’re having fun doing those activities, we will also enjoy solving story problems.”



Lesson 41 - Story Problems

Turn to page 367 in the *Swoop into Math!* activity book. The story problems throughout this lesson are listed here for your student to either read aloud or follow along with as you read. She can also use

New Teaching (continued)

this page to underline pertinent numbers, the question that needs to be answered, or anything else that she might find helpful.

Story problem #1: You and 5 friends have \$45 to exchange for tokens at the arcade. Each dollar is worth 4 tokens. If you and your 5 friends split the tokens equally, how many tokens will each person get?

“Let’s read the problem one more time. As we read, I would like you to underline any information you think is important for helping us solve the problem. If any extra information isn’t necessary, you can cross it out.”

“What did you choose to underline or cross out in this story problem, and why?” *I underlined “You and 5 friends” because that tells me how many people there are. I also underlined \$45 and 4, because that tells me how to figure out how many tokens they can get. I underlined “equally”, and I underlined the question that asked how many tokens each person would get.*

If your student is unsure what to underline or did not underline one of the pieces just mentioned, model this for her by sharing that you would also underline that piece of information while explaining why it is important.



“Great. What strategy do you want to use to solve this story problem?” *I know I need to multiply, so I can use partial products to find the product.*

Allow your student to use the *Multiplication Table*, if needed.

“What is the product? What does this number tell you about the problem?” *They can get 180 tokens.*

“Nice. Look back at the story problem. What question did it ask us?” *It asked us if we split the tokens equally between six people, how many would each person get.*

A common mistake your student might make is thinking that only five people will split the tokens instead of six. If this happens, have your student look back at the problem and focus on the words “You and five friends.” You can use your fingers to demonstrate that this equals six by first saying “you” while holding up one finger and then saying “five friends” while holding up five fingers on your other hand.



“What is our next step?” *We need to divide 180 by 6.*

“Yes. Use partial quotients to help you divide.” Your student may use the *Partial Quotient Division Mat*, if needed.

New Teaching (continued)

“I see that your answer is 30. What does that number represent in this story?” *The number of tokens that each person will get.*

“That’s correct. Do we need to do anything else, or is that the answer to the problem? How do you know?” *That’s the answer because the question asks us how many tokens each person will get.*

“Way to go! Let’s try another one.” Clear the dry-erase board.

Story problem #2: In the first 2 hours at the arcade, Benji played 7 games and earned 146 tickets after each game. Sophia played 12 games and got 98 tickets after each game. Alex earned 75 tickets after each of the 9 games he played. How many more tickets has Sophia won than Benji?



Encourage your student to underline necessary information and to cross out unnecessary information. Her copy of the story problem is for her to use in any way that will be helpful to her.

“What important information do we know in this story problem?” *We know that Benji played 7 games and earned 146 tickets after each game. Sophia played 12 games and got 98 tickets after each one.*

“That’s right! What is the question asking us to solve for?” *How many more tickets does Sophia have than Benji?*

“Yes! Is any information unnecessary to solve the problem? How do you know?” *Yes, we don’t need to know that they earned the tickets in the first 2 hours. We also don’t need to know how many games Alex played or the number of tickets he has, because the question only asks about Sophia and Benji.*

“You’re right. Now that we’ve analyzed the problem, make a tape diagram on the dry-erase board to help us represent it.”

Benji						
146	146	146	146	146	146	146
?						

Sophia											
98	98	98	98	98	98	98	98	98	98	98	98
?											

“Nice work. To solve the problem and find out how many more tickets Sophia has than Benji, we first need to figure out how many tickets they each have. How can we find the total number of tickets each person has?” *Multiply.*

New Teaching (continued)

Your student might suggest adding to find the total number of tickets for each person. Recognize that this is correct, but also remind her that repeated addition is the same as multiplying and that, because there are so many numbers, it will be quicker to use multiplication.



“Yes. Use partial products to help you multiply and find the number of tickets that Benji and Sophia each have.” (*Answer: Benji has 1,022 tickets, and Sophia has 1,176 tickets.*)

<p>Benji</p> <table border="1" style="width: 100%; text-align: center;"> <tr> <td>146</td><td>146</td><td>146</td><td>146</td><td>146</td><td>146</td><td>146</td> </tr> <tr> <td colspan="7" style="border-top: 1px solid black;">1,022</td> </tr> </table>	146	146	146	146	146	146	146	1,022							<table style="width: 100%; text-align: center;"> <tr> <td></td><td>100</td><td>+</td><td>40</td><td>+</td><td>6</td><td></td> </tr> <tr> <td>7</td><td>700</td><td></td><td>280</td><td></td><td>42</td><td></td> </tr> <tr> <td></td><td colspan="5">700 + 280 + 42 = 1,022</td><td></td> </tr> </table>		100	+	40	+	6		7	700		280		42			700 + 280 + 42 = 1,022																		
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10		900		80																																													
+	2	180		16																																													
900 + 180 + 80 + 16 = 1,176																																																	

“Nice. Look back at the story problem. What do we need to do next? How do you know?” *The question asks us how many more tickets Sophia has than Benji. We need to subtract to find out how many more.*

“Exactly. What is the difference? What does this number represent?” *Sophia won 154 tickets more than Benji.*

Clear the dry-erase board.

Story problem #3: You used all your tokens and won 2,357 tickets at the arcade! You decide to cash in your tickets for some prizes. There is a small stuffed animal for 340 tickets and a large one for 685 tickets. You choose to get the large stuffed animal. Then, with your remaining tickets, you choose 4 beach toys. If the beach toys each cost the same number of tickets, how much did each beach toy cost?

“What information in this problem will help us solve it?” *I won 2,357 tickets and spent 685 of them. Then, I used the remaining tickets to get 4 more toys.*

“Good job! Was anything extra added that we don’t need to know?” *We don’t need to know the cost of the small stuffed animal because I didn’t get it.*

“Right. Write an equation to represent the first step in this story problem. Use the letter t to represent what we don’t know.”
(*Answer: $2,357 - 685 = t$*)

“Use the dry-erase board to help you subtract. What is the difference?”
One thousand six hundred seventy-two.

New Teaching (continued)

“Nice job! What does that number represent in the problem?” *The number of tickets that I had left after getting the large stuffed animal.*

“Yes. Look back at the story problem. Does this answer our question, or do we have another step?” *We need to take another step. We need to divide by four to find out how much each beach toy costs.*

“Exactly. Write the equation that we can use to represent this part of the problem. You can use any letter to represent the unknown.”
(*Answer: $1,672 \div 4 = e$*)

Your student can use any letter for the missing variable. If she is unsure how to write the equation, support her by writing “remaining tickets \div number of beach toys = cost of each beach toy.” Then, have her identify the number that each description represents so that she can write her equation.



“That’s it. Use partial quotients to help us divide. Work it out on the dry-erase board, and then share your answer. What does this number mean?” *The quotient is 418. Each beach toy costs 418 tickets.*

Have your student continue practicing by solving the remaining problems on the *Lesson 41 – Story Problems* page. Encourage her to underline important information and represent the problem using a model, a tape diagram, or an equation. Then, have her choose one problem and share the steps that she followed to find the answer.

Answer Key

- Story problem #4: The basketball game at the arcade gives each player 17 tickets for each shot made in the first minute and 24 tickets for each shot made in the last 30 seconds. Alex made 14 shots in the first minute and 12 shots in the last 30 seconds. He had made 2 fewer baskets than his best score. How many tickets did Alex win playing this time? (*Answer: 526 tickets; $17 \times 14 = 238$, $24 \times 12 = 288$, $238 + 288 = 526$*)
- Story problem #5: Sophia won 3,009 tickets at the arcade. She decides to give 450 of her tickets to Darren so he will have enough to get the prize he wants. Sophia wants to use her remaining tickets to get 3 tech toys. If each toy needs 850 tickets, does she have enough tickets to get all 3 of them? If so, how many tickets will she have left? (*Answer: Yes, she will have nine tickets left over; $3,009 - 450 = 2,559$, $850 \times 3 = 2,550$, $2,559 - 2,550 = 9$*)
- Story problem #6: Benji’s mom gives him \$10 to spend on snacks and \$24 to spend on extra tokens at the arcade. Each dollar spent on tokens is worth 4 tokens. Benji decides to split the tokens equally with you. If you already have 96 tokens, how many will you have in total? (*Answer: 144 tokens; $24 \times 4 = 96$, $96 \div 2 = 48$, $48 + 96 = 144$*)

Complete Activity Sheet

“Let’s practice solving story problems!”

The image shows two pages from a math activity book. Each page features a 'Prize Chart' and a story problem. The prize charts list items and their costs in tickets. The story problems describe a person's purchases and ask for calculations based on the remaining tickets.

Prize	Cost (Tickets)
Beach Ball	100
Jump Rope	1,200
Beach Book	1,000
Journal	1,500
Chapter Book	2,000

Picking Prizes

Turn to pages 369 and 370 in the *Swoop into Math!* activity book.

Have your student solve each story problem using the arcade’s prize chart. Remind her to underline important information and to cross out unnecessary information. Have her draw models or write equations to help solve the story problems.

important information and to cross out unnecessary information. Have her draw models or write equations to help solve the story problems.

Answer Key

- 3,259 tickets
- 1 jump rope
- 1,380 tickets
- 2,549 tickets leftover. Yes, they have enough tickets to get another chapter book.
- No, she needs 6 more tickets.
- Each person will get 1,342 tickets. They can each get a jump rope, a beach ball, or a journal.



Look For

Each problem requires more than one step to find the answer. While working to solve the problem, your student might stop after the first step, or she might use incorrect operations.

Here’s How to Help: Ask your student what the value she found represents in the problem and if it answers the question being asked. If she uses an incorrect operation, have her model the problem, showing what is happening to make the operation needed clear.

Math Reflection

“Let’s Reflect!”

Ask some questions to guide your student’s reflection:

- “How does making a model or writing an equation help you figure out what to do to solve a story problem?”
- “How will you know if you need to do more than one step to find the answer?”
- “What is one thing that was challenging that you’d like to continue working on?”

Arcade Adventure

“Let’s practice our math skills!”

Materials

- Arcade Adventure Cards, *Swoop into Math!* pages 373 to 376
- dry-erase board and marker
- Two-Color Counters



Directions

1. On the dry-erase board, create a T-chart that has one column for each player to keep track of the scores for each round. Give each player 15 two-color counters.
2. Cut out the *Arcade Adventure* cards. Spread out the cards token-side up in the workspace.
3. Player 1 chooses a game (that is, an *Arcade Adventure* card) to solve. She must have enough tokens (two-color counters) left to be able to play the game she chooses. She counts out the number of tokens the game costs and pays them into a discard pile.
4. Player 1 then works to solve the problem. If correct, she records the number of tickets listed on the card in her column of the T-chart and places the card in a discard pile. Players will add their total number of tickets with each turn. If incorrect, she records nothing and returns the card to the workspace.
5. Player 2 takes a turn.
6. Play continues until either both players run out of two-color counters or all the story problems have been solved.
7. The player who has the most tickets is the winner!

Answer Key

A: 4,537; B: 58; C: 40; D: 24; E: 1,148; F: 75; G: 719; H: 86; I: 1,204; J: 201; K: 689; L: 414; M: 240; N: 2,315; O: No; P: 122; Q: 7,920; R: 380; S: 25; T: 784

Track Your Progress

Mark the Progress Chart



Have your student mark Lesson 41 on the Progress Chart.

APPENDIX A

Scope and Sequence of Level 4

Your Student Will:	Lesson
Review skills and concepts involving numbers up to nine digits, and multiplying and dividing numbers within 100.	1
Review skills and concepts involving fractions.	2
Learn to identify and draw models to represent fractions.	3
Learn to analyze and compare fraction models.	4
Learn to order fractions with the same denominator and solve elapsed time story problems.	5
Learn to order fractions with the same numerator and identify and convert customary volume units.	6
Learn to use visual representations to analyze and compare fractions that have the same size and identify and convert customary volume and weight units.	7
Learn to compare the size of fractions by comparing them to the benchmarks of $\frac{1}{2}$ and 1 and identify and convert customary length units.	8
Learn to generate equivalent fractions by using multiples of the numerator and denominator and identify and convert metric volume units.	9
Learn to compare two fractions by making common denominators and by using symbols.	10
Learn to compare multiple fractions and order them according to size.	11
Review all concepts learned in Lessons 3–11.	12
Use base-10 blocks to model and understand tenths and hundredths and identify and convert metric weight units.	13
Learn to make sense of tenths and hundredths in decimal notation.	14
Learn to represent and write decimals given another representation and identify and convert metric length units.	15

Your Student Will:	Lesson
Learn to reason about equivalent tenths and hundredths using decimal notation.	16
Explore the relationships between place values in decimals up to the hundredths place.	17
Learn to identify and explain the value of digits in a number up to the hundredths place.	18
Learn to locate decimals using a number line and classify shapes by line types.	19
Learn to round decimals to the nearest tenths and whole number.	20
Learn to reason and compare the size of decimals using a number line.	21
Learn to order decimals and classify shapes by angle types.	22
Review all concepts learned in Lessons 13–22.	23
Learn to multiply a two- to four-digit whole number by a one-digit number using place value understanding and properties of operations.	24
Learn to multiply two-digit numbers by two-digit numbers using place value understanding and properties of operations.	25
Learn to find whole-number quotients using partial quotient division.	26
Learn to find quotients with remainders.	27
Learn to solve division story problems and interpret the meaning of remainders based on the context of the problem.	28
Learn that every fraction can be written as the product of a whole number and unit fraction.	29
Learn to use models to represent and find the product of a whole number and a non-unit fraction.	30
Learn strategies for adding fractions with the same denominator.	31
Learn strategies for subtracting fractions with the same denominator.	32
Learn to use equivalent fractions to add tenths and hundredths.	33
Review all concepts learned in Lessons 24–33.	34

Your Student Will:	Lesson
Learn to identify and draw lines, segments, and rays.	35
Learn to measure angles and find an unknown angle.	36
Learn to analyze and extend visual patterns that repeat by a rule.	37
Learn to analyze, describe, and extend numerical patterns that follow a rule.	38
Learn to represent situations and descriptions of multiplicative comparison using models.	39
Learn to represent and solve comparison problems that use multiplication, including those involving unknown factors.	40
Learn to solve multistep problems involving the four operations.	41
Review all concepts learned in Lessons 3–41.	42

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 later levels 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