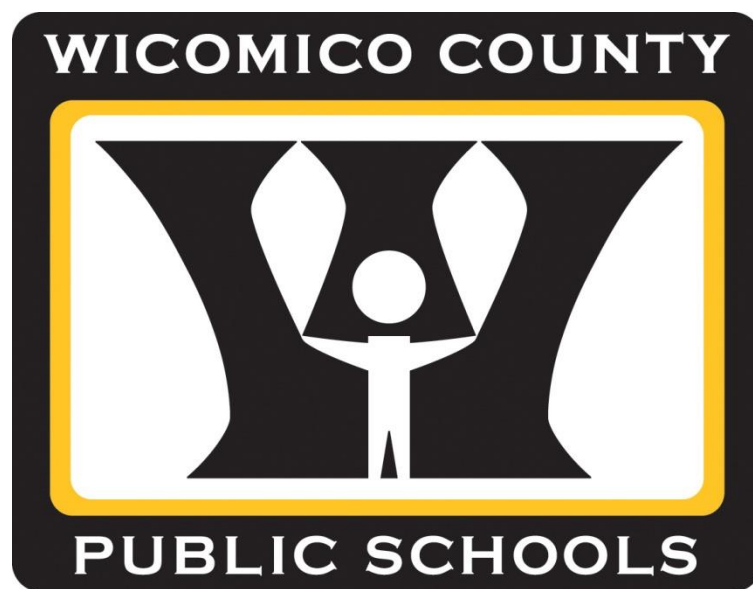


**Grade 3
Mathematics Curriculum Resource
for the Maryland College and Career Ready
Standards**



Everyday Mathematics 4

- EM4 strategically distributes instruction and practice in a spiral design format. Therefore, it is vital to follow the sequence of lessons and units.
- The goal is to complete four lessons per week utilizing the fifth day for reviewing concepts through EM 4 activities, differentiation, additional resources, and enrichment.
- The additional resources listed in this document are to supplement lessons for differentiation, re-teaching, or review.
- Since the program spirals, it is **not** necessary to master concepts before moving on.
- Some lessons may take more than one day. However, you should adhere to the suggested timeline for each unit in this document so that your students will be adequately prepared for local assessments and MCAP.
- It is required that you complete the Open Response and Reengagement lessons in each unit. These provide you with formative information which focus on the eight Standards for Mathematical Practice. Utilize PLCs for scoring and range finding.
- It is expected that information be distributed to families regarding the Clever login procedure to access math apps and programs.
- “Math Boxes” are a daily math student journal page or activity that reviews material on a regular basis and can be completed at any point during the day. It can provide useful ongoing assessment information.
- Games are a vital part of the program. They provide the repetition of the concepts needed for reinforcement and practice; therefore, they should be played regularly.
- It is expected to continue the routines of Math Meetings and Number Talks in addition to the EM 4 lesson components. (See the Suggested 75-minute planning template).
- The county expectation for **DreamBox** is 5 lessons per week.
- Continue to utilize the ES9 Tasks, Tackle the Task Booklet, and Reasoning and Modeling Item Bank, which can be found on the shared drive and/or eDoctrina.

Components for Focus, Coherence and Rigor

These components can be found at the beginning of each unit to focus instruction on rigorous content, as well as coherence of vertical alignment across grade levels.

ABOUT EVERYDAY MATHEMATICS

Build Mathematical Literacy

Designed for College and Career Readiness, *Everyday Mathematics* builds a solid foundation for success in your mathematics classroom through meaningful practice opportunities, discussion of reasoning and strategies, and engagement in the mathematical practices every day.

Focused Instruction

The instructional design of *Everyday Mathematics* allows you to focus on the critical areas of instruction for each grade.

Lesson
2-6

Application: Unit Conversions

Overview: Students use unit conversions within the U.S. customary system to solve multistep problems.

Before You Begin
For Part 2, prepare two volume tubes labeled as follows. Decide how you will display the number shown from pages 140 and 144. If additional sets of Prior Knowledge cards are needed for Part 3, copy and cut out the Math Minutes pages 140 and 144.

Vocabulary
measurements; units; convert; number model; relation symbol; expression

Standards

Focus Clusters

- Solve real-world problems involving measurement.
- Perform operations with multi-digit whole numbers and understand the relationship between the units.
- Convert like measurement units within a given measurement system.

1 Warm Up 5 min **Materials**

Mental Math and Fluency
Students convert between units of length.

2 Focus 35-40 min

Math Message Student Reference Book p. 108 **S.M.1.1**

Focus Clusters

Everyday Mathematics identifies the clusters addressed in the Focus part of each lesson to help you understand the content that is being taught in the lesson.

Focus

In this unit, students explore patterns in the base-10 place value system. Students are also introduced to U.S. traditional multiplication.

Major Clusters

S.M.1.1 Understand the place value system.

S.M.1.2 Perform operations with multi-digit whole numbers with the

Supporting Cluster

S.M.1.3 Convert like measurement units within a given measurement

Process and Practice Standards

MP.1 Make sense of problems and persevere in solving them.

MP.5 Attend to precision.

Focus

In Unit 2, students explore patterns in the base-10 place value system and ways of representing large numbers. Students are also introduced to U.S. traditional multiplication and review partial quotient division.

Major Clusters

S.M.1.1 Understand the place value system.

S.M.1.2 Perform operations with multi-digit whole numbers with decimals

S.M.1.3 Convert like measurement units within a given measurement

S.M.1.4 Convert like measurement units within a given measurement

S.M.1.5 Convert like measurement units within a given measurement

S.M.1.6 Convert like measurement units within a given measurement

S.M.1.7 Convert like measurement units within a given measurement

S.M.1.8 Convert like measurement units within a given measurement

S.M.1.9 Convert like measurement units within a given measurement

S.M.1.10 Convert like measurement units within a given measurement

Coherence Within and Across Grades

Spiral Towards Mastery

Carefully crafted, research-based learning progressions provide opportunities for your students to connect skills, concepts, and applications, while developing deep understanding, long-term learning, and transfer of knowledge and skills to new contexts.

Spiral Towards Mastery

The *Everyday Mathematics* curriculum is built on the spiral approach to learning. Concepts and skills are introduced in one unit and then revisited in subsequent units, allowing students to build on their understanding and apply their knowledge in new contexts.

Key Features of the Spiral Approach:

- Revisit:** Concepts and skills are revisited in subsequent units.
- Build:** Students build on their understanding and apply their knowledge in new contexts.
- Transfer:** Students transfer their knowledge and skills to new contexts.

Coherence

The table below describes how standards addressed in the Focus parts of the lessons link to the mathematics that students have done in the past and will do in the future.

	Links to the Past	Links to the Future
S.M.1.1	In Unit 1, students reviewed how to use grouping symbols in expressions and how to evaluate expressions with grouping symbols. In Grade 3, students will use the order of operations to evaluate expressions and perform operations according to the Order of Operations.	In Unit 7, students will use grouping symbols as an exponent to model how to solve a multistep problem about gaging reaction times. In Grade 8, students will evaluate expressions and perform operations according to the Order of Operations.
S.M.1.2	In Unit 1, students represented the volume of rectangular prisms using expressions. They also wrote expressions to record calculations in the game <i>How Many?</i> In Grade 4, students will represent problems using equations with a letter standing for an unknown quantity.	Throughout Grade 5, students will write expressions to record calculations in a variety of contexts. In Unit 8, they will enter and interpret expressions without evaluating them. In Grade 6, students will write expressions in which letters stand for numbers.

Linking Prior and Future Knowledge

Each unit contains information about how the focus standards covered in the unit developed in prior units and grades and how your instruction lays the foundation for future lessons.

Rigorous Content

Everyday Mathematics gives you the tools and resources you need to emphasize conceptual understanding, procedural fluency, and applications with equal intensity.

	2-3 Understanding Place Value	2-3 Exponents and Powers of 10	2-3 Applying Powers of 10	2-3 U.S. Traditional Multiplication, Part 1
Conceptual Understanding	The relationship between place in multi-digit numbers. Doubling, Place Value, and Halving. <i>Home Link</i> p. 110	Exponential notation. Introducing Powers of 10. <i>Home Link</i> p. 110	Exponential notation. Introducing Powers of 10. <i>Home Link</i> p. 110	Multiplying by 10. Multiplying by 100. <i>Home Link</i> p. 110
Procedural Skill and Fluency	<i>Home Link</i> p. 110	<i>Home Link</i> p. 110	<i>Home Link</i> p. 110	<i>Home Link</i> p. 110
Applications	<i>Home Link</i> p. 110	<i>Home Link</i> p. 110	<i>Home Link</i> p. 110	<i>Home Link</i> p. 110

Components for Differentiation

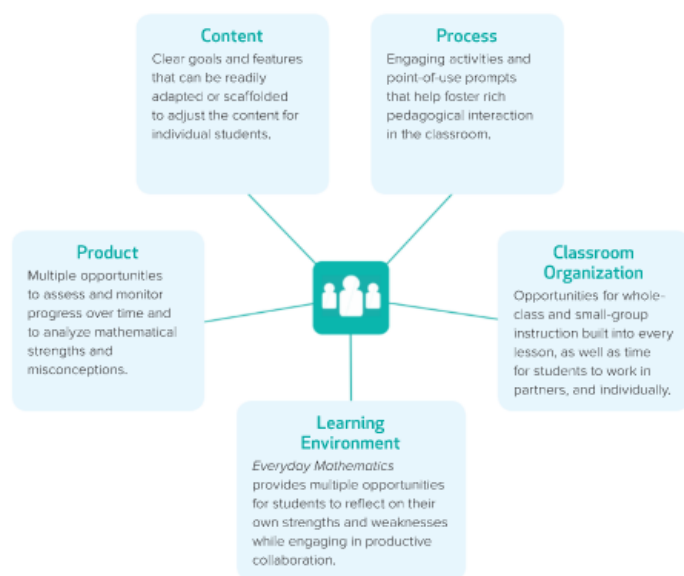
These components provide instructional support within the lessons to address the needs of special populations.

EVERYDAY MATHEMATICS IN YOUR CLASSROOM

Differentiation System

Everyday Mathematics fosters rich learning environments that provide multiple avenues for mastering content, making sense of ideas, developing skills, and demonstrating knowledge. This allows rigorous mathematics content to be accessible and engaging for all students.

Everyday Mathematics Differentiation Model



Differentiation Options

Readiness	Enrichment	Extra Practice
Counting to Convert Inches to Feet 3.MD.A.1, 3.MD.A.2 per group, three 12-inch rulers 36 square pattern blocks To explore unit conversions using concrete models, students count how many 1-inch square pattern blocks are equal to the length of a 1-foot ruler. Distribute 36 square pattern blocks to each group, explaining that each pattern block is 1 inch long. Have students line up the blocks from	Writing Unit Conversion Number Stories 3.MD.A.1 Activity Card 20 Math Journal 1 p. 52, Student Reference Book p. 53 To extend their work with unit conversions, students write unit conversion number stories using the problems as journal page 52 as examples. Partners solve each other's number stories.	Converting Units 3.MD.A.1, 3.MD.A.2 Activity Card 20 Student Reference Book p. 53, Student Reference Book p. 54 For more practice, students roll a die to generate unit conversion problems. For example, label a 1-foot ruler with the word <i>inches</i> and the units of measure, 1 foot = 12 inches. Other useful measurement tools to label and display include a protractor and a measuring cup.

English Language Learner
Beginning ELL To transition students with U.S. customary measurement and word meaning tools, display everyday measuring tools labeled by name and showing common conversions. For example, label a 1-foot ruler with the word *inches* and the units of measure, 1 foot = 12 inches. Other useful measurement tools to label and display include a protractor and a measuring cup.

Supplementary Activities

Everyday Mathematics offers specific differentiation options in every lesson for:

- Students who need more scaffolding
- Students who need extra practice
- Advanced Learners
- Beginning English Language Learners
- Intermediate and Advanced English Language Learners

Lesson 2-6 Application: Unit Conversions

Meeting Language Demands

For Beginning ELLs...

- When asked to write conversions with longer numbers to measure, the complexity increases. Encourage students to use unit cubes and paper cubes to measure objects and record the results.
- Explain to students that they can use unit cubes and paper cubes to measure objects and record the results.
- Encourage students to use unit cubes and paper cubes to measure objects and record the results.

For Intermediate and Advanced ELLs...

- Encourage students to use unit cubes and paper cubes to measure objects and record the results.
- Encourage students to use unit cubes and paper cubes to measure objects and record the results.
- Encourage students to use unit cubes and paper cubes to measure objects and record the results.

Language Assessment

- Encourage students to use unit cubes and paper cubes to measure objects and record the results.
- Encourage students to use unit cubes and paper cubes to measure objects and record the results.
- Encourage students to use unit cubes and paper cubes to measure objects and record the results.

Math Message

Converting Miles to Feet

Beginning ELLs To help students understand the meaning of the word *convert*, use a number line to show the relationship between miles and feet. For example, 1 mile = 5,280 feet. Encourage students to use unit cubes and paper cubes to measure objects and record the results.

Adjusting the Activity

To help students focus on the digits being used in each step, suggest covering the 2 with a slip of paper while working on Step 1 and the 5 while working on Step 2. It may be helpful to have students write down the results of each step as they work. Encourage them to check their work by adding the results of each step.

Common Misconception

Differs from In Step 1, after multiplying 3 by 0 tens, some students may write 0 below the tens column. Remind them that in each step they should multiply and add in any extra tens or hundreds they have recorded. Encourage them to move out each digit as they add it.

Point-of-Use Differentiation

Assessment Adjustments Suggestions for scaffolding and extending Progress Check assessments.

Game and Activity Adjustments Recommendations for tools, visual aids, and other instructional strategies that provide immediate support.

Adjusting the Activity Suggestions for adapting activities to fit students' needs.

Common Misconceptions Notes that suggest how to use observations of students' work to adapt instruction.

Lesson Supplements

Almost every lesson has Differentiation Support Pages found in the Connected Teacher Center that offer extended suggestions for working with diverse learners, including English Language Learners and students who need more scaffolding.

WIN Time and Flex Day Clarification

WIN (What I Need) Time 25 Minutes Daily	Flex Days 1-2 Per Week
<p>**Use eDoctrina Unit Report, MAP reports, exit tickets, clipboard cruising, etc. to determine what you will focus on during both WIN time and flex days.</p> <p>**Dreambox can be utilized either day, but usage should not exceed 60 minutes per week.</p>	
<ul style="list-style-type: none"> • Meet with small groups based on data. • Different groups can focus on different skills. • <i>Do the Math</i> small groups meet. • Provide enrichment as well as intervention. 	<ul style="list-style-type: none"> • This is a teaching day, whether it be whole group or small group, it is not a game day. • These days can be used to “catch up” if you are beyond the suggested dates of the At-a-Glance document. • Reteach or extend a lesson. • Build background for an upcoming unit. (Example: Review equivalent fractions before a unit on adding fractions with unlike denominator.) • Use additional resources from Google shared drive unit folders. • Complete writing tasks from Reasoning and Modeling Item Bank. • Give students opportunities to work with problems in the format they will encounter on MCAP. (MCAP Practice Tests, MCAP Released Items, Responses Requiring Students to TYPE Responses) • Give students activities to promote independence. Written or task type activities should be completed without support/clarification and with time limits. • Use technology resources aligning with current unit including Braining Camp or Tang Math.

GR K-5 Suggested Math Lesson Plan Template (75 Minute Block)

EM4 Lesson and Overview –							
Standards/Objectives –							
Standards for Mathematical Practice (Circle those applicable.)							
1. Students make sense of problems and persevere in solving them	2. Students reason abstractly and quantitatively	3. Students construct viable arguments and critique the reasoning of others	4. Students model with mathematics	5. Students use appropriate tools strategically	6. Students attend to precision	7. Students look for and make use of structure	8. Students look for and express regularity in repeated reasoning
**Times are approximate and may vary for each component based on lesson/skill.							
Lesson Component	Time	Activities				Materials	
Lesson Openers	10 min	<ul style="list-style-type: none"> Math Meeting and/or Number Talk Daily Structured Word Problem 				Number Talk Book Quick Look Cards (K-3) Math Meeting Materials Tang Math Word Problems	
	10 min	<ul style="list-style-type: none"> <u>Strategy</u> focused basic fact <u>discussion</u> 					
	Time	EM4 Focus				Materials	
Lesson Focus (Step 2) (2-4 activities) Practice (Step 3)	30 min	<ul style="list-style-type: none"> Math Message Share objective, essential questions, and success criteria Focus Activities Journal Pages/Reasoning & Modeling Tasks Math Boxes – Math Boxes must be completed daily to give students sufficient opportunities to review skills and concepts. Assessment Check-In 				EM4, Math Journals Reasoning & Modeling Tasks 3 Act Tasks Tang Math Nearpod Brainiaccamp	
Lesson Component	Time	Activities				Materials	
Supplemental Support	15-20 min	<ul style="list-style-type: none"> Small Group Support/DreamBox 				EM4 Tang Math	
Lesson Component	Time	Activities				Materials	
Closure	5-10 min	<ul style="list-style-type: none"> Review objective(s), essential question, and success criteria. Students reflect on their learning and the success criteria 				Formative assessment in eDoctrina Exit ticket	

GR K-5 Suggested Math Lesson Plan Template (75 Minute Block)

EM4 Lesson and Overview –							
Standards/Objectives –							
Standards for Mathematical Practice (Circle those applicable.)							
1. Students make sense of problems and persevere in solving them	2. Students reason abstractly and quantitatively	3. Students construct viable arguments and critique the reasoning of others	4. Students model with mathematics	5. Students use appropriate tools strategically	6. Students attend to precision	7. Students look for and make use of structure	8. Students look for and express regularity in repeated reasoning
**Times are approximate and may vary for each component based on lesson/skill.							
Lesson Component	Time	Activities				Materials	
Lesson Openers	10/15 min	<ul style="list-style-type: none"> Math Meeting and/or Number Talk Daily Structured Word Problem 					
	10 min	<ul style="list-style-type: none"> <u>Strategy</u> focused basic fact <u>discussion</u> 					
	Time	EM4 Focus				Materials	
Lesson Focus (Step 2) (2-4 activities) Practice (Step 3)	30 min	<ul style="list-style-type: none"> Math Message Focus Activities Journal Pages/Math Boxes/ ACIs 					
Lesson Component	Time	Activities					
Supplemental Support	15-20 min						
Lesson Component	Time	Activities				Materials	
Closure	5-10 min						

Math Meetings

Math Meetings **must** be done 2-5 times a week. A Math Meeting gets your students thinking and ready for math class. It helps create a routine for part of the 75-minute math block.

Value of Routines -

1. Bring sense of predictability and comfort to our classrooms.
2. Help with organization and classroom management and help make transitions smooth.
3. Can enhance instruction.
4. Offer access to big ideas in mathematics and allow deep understanding of math concepts.
5. Can be designed to focus on the desired math content/student needs.
6. Give students opportunities to develop expertise with the eight Standards for Mathematical Practice.

Elements of a Math Meeting:

- Takes place daily unless a full Number Talk is done that day
- Is 10 - 15 minutes in duration (timer would be helpful)
- Students use whiteboards/pinch cards/templates to show responses
- Include a variety of activities based on place value, facts fluency, number sense, and problem solving
- The expectation is to complete several activities in 10-15 minutes
- Students can be brought to a common area around the teacher (or move some closer)
- Review of skills previously taught this year and earlier years (spiral)
- Add variety as the year progresses

Suggested Math Meeting Activities:

Array Cards

Multiplication Representation Cards

Here to There

Triangle Fact Cards (Pinch Cards)

Number of the Day

Equal or Not Equal

Tell Time to Nearest 5 minutes

Four Square- Multiplication and Division

Number Jumbles

Hit the Target

Measuring Mass and Volume Cards

What Shape Am I?

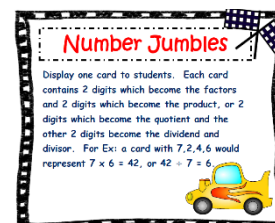
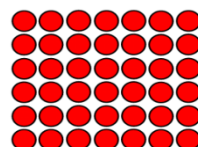
Missing Coin Strips

Odd Man Out

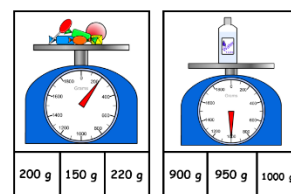


Three-Digit Number Representations 500 to 999

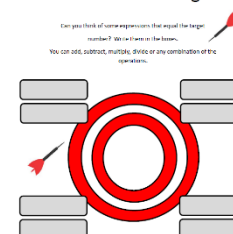
$30 + 7 + 600$	$7 + 20 + 500$
$90 + 700$	$60 + 7 + 900$



$20 + 10$	$30 + 30$
$50 + 20$	$60 + 10$
$70 + 10$	$80 + 20$
$60 + 30$	$40 + 40$



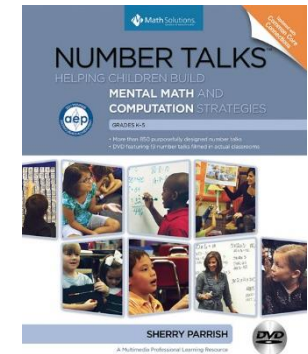
Can You Hit the Target?



18	→	42
47	→	84
31	→	55
78	→	87
6	→	32

Number Talks

Number Talks **must** be done at least 2-3 times a week. The activity will take between 5 and 15 minutes. Sherry Parrish's book, *Number Talks*, provides examples that will help build students' fluency, mental math capabilities and reasoning skills. Video clips from Math Solutions can be found on the disc located in your Number Talks book.



During the Number Talk, the teacher is not the definitive authority. The teacher is the facilitator and is listening for and building on the students' natural mathematical thinking. The teacher writes a problem horizontally on the board in whole group or a small setting. The students mentally solve the problem and share with the whole group **how** they derived the answer. They must justify and defend their reasoning. The teacher simply records the students' thinking and poses extended questions to draw out deeper understanding for all.

The effectiveness of *Numbers Talks* depends on the routines and environment that is established by the teacher. Students must be given time to think quietly without pressure from their peers. To develop this, the teacher should establish a signal, other than a raised hand, of some sort to identify that one has a strategy to share. One way to do this is to place a finger on their chest indicating that they have one strategy to share. If they have two strategies to share, they place out two fingers on their chest and so on.

Number talks often have a focus strategy such as “making tens” or “compensation.” Providing students with a string of related problems, allows students to apply a strategy from a previous problem to subsequent problems. Some units lend themselves well to certain Number Talk topics. These mental math strategies should be applied with problems throughout daily math lessons.

Wicomico County's Fact Fluency Expectations

A substantial amount of mathematics education research shows that children do not master their math facts through memorization alone. Instead, true mastery comes from being equipped with quick and effective strategies for finding the solution. By using these strategies, children will always have the mental tools needed to find the correct answer and the confidence to use them (Boaler, 2009).

Pivotal Ideas for Numerical Fluency (Steve Leinwand)

1. All quantities are comprised of **parts and wholes** so that one understands that quantities can be put together and taken apart in a variety of ways.
2. All numbers greater than 1 can be **decomposed into small numbers**. Automaticity with decomposing the numbers 3, 4, 5 and 6 are non-negotiable and completely teachable aspects of numerical fluency. **THIS ONE IS A GATEKEEPER!**
3. **Acquisition of the language of the four operations** must precede the learning of facts because number sentences and equations make no sense unless grounded in situations. Accordingly, storytelling and acting out are essential strategies for developing operation sense and numerical fluency.
4. There are several **powerful properties of operations** that reduce memory load and contribute to numerical fluency.
5. **Numerical fluency requires that students talk** about how numbers relate to one another and participate in discussions of alternative approaches that students use.
6. **5 and 10 are cornerstones of numerical fluency** and play a critical role in our number system, hence the power of five frames and ten frames. Mastery of 5 + numbers, that is, $5 + 1$, $5 + 2$, $5 + 3$, etc., is critical for developing fluency.
7. **A deep understanding that 9 and $(10 - 1)$** are the same number, supports numerical fluency with a range of so-called “hard” addition, subtraction, multiplication and division facts.
8. **Deep knowledge of groups of 2, 3, 5 and 10 are cornerstones to multiplication fluency.**
9. **Addition facts are a foundation for all of the rest of the operations.**
10. **Place value understanding dominates fluency with larger numbers.**

Wicomico County's Fact Fluency Expectations (cont.)

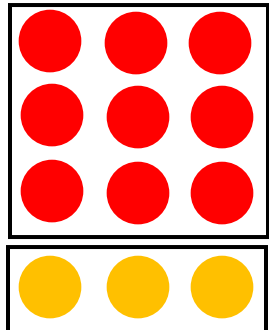
Students develop basic fact fluency through stages:

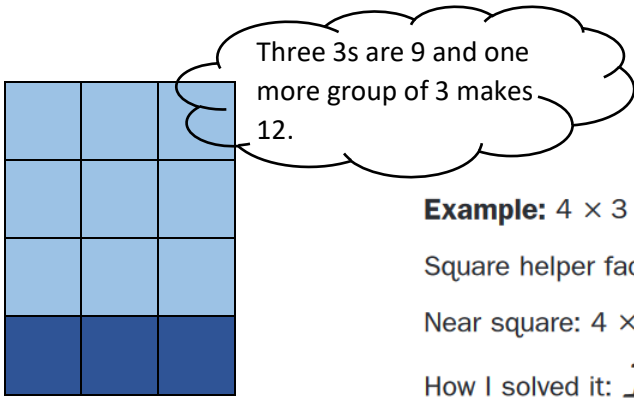
1. Introduce a strategy with concrete materials and pictorial representations.
2. Reinforcing the strategy through pictorial models and connecting it to the symbolic models.
3. Practice the strategy through a range of activities that are written and oral. This stage develops accuracy and speed of recall.
4. Extend the strategy by applying the strategy to other numbers.

In grades 3-5 stage 1 and 2 utilize square tiles, counters, graph paper, arrays and equal grouping representations, and repeated addition. Then students should connect pictorial models to a written strategy first by orally explaining and then by writing.

By mid-year, the focus should be on connecting to written strategies. Representations alone are not enough to demonstrate fluency.

For example: Near Squares






Example: $4 \times 3 = ?$

Square helper fact: $3 \times 3 = 9$

Near square: $4 \times 3 = 12$

How I solved it: *I added a group of 3 to find 4×3 .*



Unit	Fact Strategy
Unit 1	Review Addition and Subtraction Mixed Multiplication 2s, 5s, 10s, Fact Triangles (mult./div fact families)
Unit 2	Multiplication 0s, 1s, 2s, 5s, 10s
Unit 3	Squares, adding a Group or Subtracting a Group (3s, 4s, 6s, and 9s) Turn-around-facts (Commutative Property)
Unit 4	All of the above
Unit 5	Doubling (4s, 6s, 8s), Near Squares, Break-Apart Factors
Units 6, 7, 8, and 9	All of the above

Resources for Fluency Practice

See Chapter 3: Helping Children Master the Basic Facts in Van de Walle (3-5)

EM 4 Strategies: Skip Counting, Turn-Around Rule (Commutative Property), Repeated Addition, Break Apart, Adding a Group. Subtracting a Group, Doubling, Near Squares

Number Talks: Repeated Addition and Skip Counting, Making Landmark or Friendly Numbers, Partial Products or Distributive Property, Doubling and Halving, Breaking Factors into Smaller Factors

Quick Look Cards, Subitizing Cards, Triangle Flashcards

Games which reinforce strategies – EM 4 Games, See folder in Shared drive for additional resources

Using flashcards for purposeful practice. See Van de Walle (sorting facts, supporting a strategy)

Drill and practice which focus on strategies – See Van de Walle pg. 117, See folder in Shared drive for resources

Assessment – student interviews, observation, and writing prompts. See samples below.

Avoid timed tests and drills since they offer little insight about how flexible students are in their use of strategies or even which strategies a student selects.

FIGURE 2 Various responses to a journal prompt illustrate the strategies that first graders used and reveal which children were able to appropriately select and explain an efficient strategy for the task.

If your friend did not know the answer to $4 + 5$, how could he figure it out?

MAY 10, 2012
I would tell my friend to take 5 and count 4 in your hand

I would tell my friend to start with 5 then add 2 then one more 2 and then you have 9.

I would tell my friend to use a double plus 1. $4 + 4 = 8$ so count 1 up now you get your answer.

I would tell my friend to take away one number from ten. And that is nine. I know that five plus five equals ten.

TABLE 3 This collection of prompts addresses the four components of fluency with basic facts. Writing about their strategies on a weekly basis engages students in self-reflection and monitoring, as well as emphasizes the importance of strategies in practicing basic facts.

Writing prompts for developing fluency with the basic facts	
Appropriate strategy selection <ul style="list-style-type: none"> Explain how to use the "count on" strategy for $3 + 9$. What strategy did you use to solve $6 + 8$? A friend is having trouble with some of his times 6 facts. What strategy might you teach him? Emily solved $6 + 8$ by changing it in her mind to $4 + 10$. What did she do? Is this a good strategy? Tell why or why not. 	Flexibility <ul style="list-style-type: none"> How can you use 7×10 to find the answer to 7×9? Solve 6×7 using one strategy. Now try solving it using a different strategy. Emily solved $6 + 8$ by changing it in her mind to $4 + 10$. What did she do? Does this strategy always work?
Efficiency <ul style="list-style-type: none"> What strategy did you use to solve $9 + 3$? How can you use 7×7 to solve 7×8? Which facts do you "just know"? For which facts do you use a strategy? 	Accuracy <ul style="list-style-type: none"> Crystal explains that $6 + 7$ is 12. Is she correct? Explain how you know. What is the answer to 7×8? How do you know it is correct (how might you check it)?
Creative writing ideas that address several components <ul style="list-style-type: none"> Develop a "Face the facts" or "Ask Cougar" column (like Dear Abby) for the class. (Pick a fun name for the column that makes sense for the class, such as the school mascot.) Students send a letter about a tough fact. Rotate different students into the role of responder. The responder writes letters back, suggesting a strategy for the tough fact. Create a strategy rhyme (e.g., If times four is giving me trouble, I'll remember to double and double). Make a facts survival guide. Children prepare pages illustrating with visuals (e.g., ten frames or arrays) of how find "tough" facts. Write a yearbook entry to some facts (e.g., Dear 8×7, I ...) 	

(See McIntosh 1997 for many more ideas).

Grade 3 Overview

Operations and Algebraic Thinking (OA)

- Represent and solve problems involving multiplication and division.
- Understand properties of multiplication and the relationship between multiplication and division.
- Multiply and divide within 100.
- Solve problems involving the four operations and identify and explain patterns in arithmetic.

Number and Operations in Base Ten (NBT)

- Use place value understanding and properties of operations to perform multi-digit arithmetic.

Number and Operations-Fractions (NF)

- Develop understanding of fractions as numbers.

Measurement and Data (MD)

- Solve word problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects.
- Represent and interpret data.
- Geometric measurement: understand concepts of area and relate area to multiplication and to addition.
- Geometric measurement: recognize perimeter as an attribute of plane figures and distinguish between linear and area measures.

Geometry (G)

Reason with shapes and their attributes

Major Cluster

Supporting Cluster

Additional Cluster

Standards for Mathematical Practice	
Standards	Explanations and Examples
1. Make sense of problems and persevere in solving them.	In third grade, students know that doing mathematics involves solving problems and discussing how they solved them. Students explain to themselves the meaning of a problem and look for ways to solve it. Third graders may use concrete objects or pictures to help them conceptualize and solve problems. They may check their thinking by asking themselves, “Does this make sense?” They listen to the strategies of others and will try different approaches. They often will use another method to check their answers.
2. Reason abstractly and quantitatively.	Third graders should recognize that a number represents a specific quantity. They connect the quantity to written symbols and create a logical representation of the problem at hand, considering both the appropriate units involved and the meaning of quantities
3. Construct viable arguments and critique the reasoning of others.	In third grade, students may construct arguments using concrete referents, such as objects, pictures, and drawings. They refine their mathematical communication skills as they participate in mathematical discussions involving questions like, “How did you get that?” and “Why is that true?” They explain their thinking to others and respond to other students’ thinking.
4. Model with mathematics.	Students experiment with representing problem situations in multiple ways including numbers, words (mathematical language), drawing pictures, using objects, acting out, making a chart, list, or graph, creating equations, etc. Students need opportunities to connect the different representations and explain the connections. They should be able to use all these representations as needed. Third graders should evaluate their results in the context of the situation and reflect on whether the results make sense.
5. Use appropriate tools strategically.	Third graders consider the available tools (including estimation) when solving a mathematical problem and decide when certain tools might be helpful. For instance, they may use graph paper to find all the possible rectangles that have a given perimeter. They compile the possibilities into an organized list or a table and determine whether they have all the possible rectangles.
6. Attend to precision.	As third graders develop their mathematical communication skills, they try to use clear and precise language in their discussions with others and in their own reasoning. They are careful about specifying units of measure and state the meaning of the symbols they choose. For instance, when figuring out the area of a rectangle they record their answers in square units.
7. Look for and make use of structure.	In third grade, students look closely to discover a pattern or structure. For instance, students use properties of operations as strategies to multiply and divide (commutative and distributive properties).
8. Look for and express regularity in repeated reasoning.	Students in third grade should notice repetitive actions in computation and look for more shortcut methods. For example, students may use the distributive property as a strategy for using products they know to solve products that they don’t know. For example, if students are asked to find the product of 7×8 , they might decompose 7 into 5 and 2 and then multiply 5×8 and 2×8 to arrive at $40 + 16$ or 56. In addition, third graders continually evaluate their work by asking themselves, “Does this make sense?”

GRADE 3 COMMON CORE INTRODUCTION

In Grade 3, the majority of instructional time should focus on two critical areas: (1) operations of multiplication and division and (2) the concept of fractions. These concepts are introduced early in the year in order to build a foundation for students to revisit and extend their conceptual understanding with respect to these concepts as the year progresses. To continue the study of geometry, students describe and analyze shapes by their sides, angles, and definitions. Students need to generalize and apply strategies for computational fluency.

1. Students develop an understanding of the operations of multiplication and division through area models, arrays, pictorial representation, and equations. By the end of the year, students recall all products of two single-digit numbers.
2. Students develop understanding of fractions as numbers and compare and reason about fraction sizes. This work with fractions is a cornerstone for developing reasoning skills and conceptual understanding of fraction size and fractions as part of the number system throughout this year and their future work with fractions and ratios.

The Table below is an important resource for understanding addition and subtraction structures. Problems in this format should be used on a regular basis.

Glossary

Table 1 Common addition and subtraction situations¹

	Result Unknown	Change Unknown	Start Unknown
Add to	Two bunnies sat on the grass. Three more bunnies hopped there. How many bunnies are on the grass now? $2 + 3 = ?$	Two bunnies were sitting on the grass. Some more bunnies hopped there. Then there were five bunnies. How many bunnies hopped over to the first two? $2 + ? = 5$	Some bunnies were sitting on the grass. Three more bunnies hopped there. Then there were five bunnies. How many bunnies were on the grass before? $? + 3 = 5$
Take from	Five apples were on the table. I ate two apples. How many apples are on the table now? $5 - 2 = ?$	Five apples were on the table. I ate some apples. Then there were three apples. How many apples did I eat? $5 - ? = 3$	Some apples were on the table. I ate two apples. Then there were three apples. How many apples were on the table before? $? - 2 = 3$
Put Together/ Take Apart³	Total Unknown	Addend Unknown	Both Addends Unknown²
	Three red apples and two green apples are on the table. How many apples are on the table? $3 + 2 = ?$	Five apples are on the table. Three are red and the rest are green. How many apples are green? $3 + ? = 5, 5 - 3 = ?$	Grandma has five flowers. How many can she put in her red vase and how many in her blue vase? $5 = 0 + 5, 5 = 5 + 0$ $5 = 1 + 4, 5 = 4 + 1$ $5 = 2 + 3, 5 = 3 + 2$
Compare⁴	Difference Unknown	Bigger Unknown	Smaller Unknown
	(“How many more?” version): Lucy has two apples. Julie has five apples. How many more apples does Julie have than Lucy? (“How many fewer?” version): Lucy has two apples. Julie has five apples. How many fewer apples does Lucy have than Julie? $2 + ? = 5, 5 - 2 = ?$	(Version with “more”): Julie has three more apples than Lucy. Lucy has two apples. How many apples does Julie have? (Version with “fewer”): Lucy has 3 fewer apples than Julie. Lucy has two apples. How many apples does Julie have? $2 + 3 = ?, 3 + 2 = ?$	(Version with “more”): Julie has three more apples than Lucy. Julie has five apples. How many apples does Lucy have? (Version with “fewer”): Lucy has 3 fewer apples than Julie. Julie has five apples. How many apples does Lucy have? $5 - 3 = ?, ? + 3 = 5$

²These take apart situations can be used to show all the decompositions of a given number. The associated equations, which have the total on the left of the equal sign, help children understand that the = sign does not always mean makes or results in but always does mean is the same number as.

³Either addend can be unknown, so there are three variations of these problem situations. Both Addends Unknown is a productive extension of this basic situation, especially for small numbers less than or equal to 10.

⁴For the Bigger Unknown or Smaller Unknown situations, one version directs the correct operation (the version using more for the bigger unknown and using less for the smaller unknown). The other versions are more difficult.

The Table below is an important resource for understanding multiplication and division structures. Problems in this format should be used on a regular basis.

	Unknown Product	Group Size Unknown ("How many in each group?" Division)	Number of Groups Unknown ("How many groups?" Division)
	$3 \times 6 = ?$	$3 \times ? = 18$, and $18 \div 3 = ?$	$? \times 6 = 18$, and $18 \div 6 = ?$
Equal Groups	<p>There are 3 bags with 6 plums in each bag. How many plums are there in all?</p> <p><i>Measurement example.</i> You need 3 lengths of string, each 6 inches long. How much string will you need altogether?</p>	<p>If 18 plums are shared equally into 3 bags, then how many plums will be in each bag?</p> <p><i>Measurement example.</i> You have 18 inches of string, which you will cut into 3 equal pieces. How long will each piece of string be?</p>	<p>If 18 plums are to be packed 6 to a bag, then how many bags are needed?</p> <p><i>Measurement example.</i> You have 18 inches of string, which you will cut into pieces that are 6 inches long. How many pieces of string will you have?</p>
Arrays, ⁴ Area ⁶	<p>There are 3 rows of apples with 6 apples in each row. How many apples are there?</p> <p><i>Area example.</i> What is the area of a 3 cm by 6 cm rectangle?</p>	<p>If 18 apples are arranged into 3 equal rows, how many apples will be in each row?</p> <p><i>Area example.</i> A rectangle has area 18 square centimeters. If one side is 3 cm long, how long is a side next to it?</p>	<p>If 18 apples are arranged into equal rows of 6 apples, how many rows will there be?</p> <p><i>Area example.</i> A rectangle has area 18 square centimeters. If one side is 6 cm long, how long is a side next to it?</p>

***The comparison structures have been omitted from this table because they are not introduced until grade 4.**

The first examples in each cell are examples of discrete things. These are easier for students.

The language in the array examples shows the easiest form of array problems. A harder form is to use the terms rows and columns: The apples in the grocery windows are in 3 rows and 6 columns. How many apples are in there? Both forms are valuable.

Area involves arrays of squares that have been pushed together so that there are no gaps or overlaps, so array problems include these especially important measurement situations.

MCAP Grade 3 Evidence Statements

Overview

The Maryland Comprehensive Assessment Program (MCAP) includes a coherent set of summative mathematics assessments aligned to the Maryland College and Career Ready Mathematics Standards. Students are required to take the MCAP Mathematics assessment at the end of grades 3-8 and at the end of Algebra I. Students may also take a MCAP Mathematics Assessment at the end of Geometry and Algebra II.

The MCAP Mathematics assessment development process is based on [Evidence-Centered Design \(ECD\)](#). The Evidence-Centered Design process begins by establishing the answer to “What skills and understandings should be assessed?”. The MCCRMS describe the skills and understandings that the MCAP Mathematics assessments assess. Assessments are then designed to gather evidence that allows inferences to be made. Assessments can be designed to allow inferences of various grain sizes. The MCAP Mathematics assessments are summative assessments and are therefore designed to provide evidence that allows only general inferences about a student’s mathematical skills and understandings. The MCAP Mathematics Claims Structure describes the grain size of the evidence that the MCAP Mathematics assessments will yield. Assessment items are designed to elicit evidence of a student’s level of proficiency for each claim.

MCAP Mathematics Claims Structure

Master Claim

The student is college and career ready or is “On-Track” to being college and career ready in mathematics

Sub-Claims

Content	<ul style="list-style-type: none">• The student solves problems related to all content of the grade/course related to the Standards for Mathematical Practice
Reasoning	<ul style="list-style-type: none">• The student expresses grade/course level appropriate mathematical reasoning
Modeling	<ul style="list-style-type: none">• The student solves real-world problems with a degree of difficulty appropriate to the course

MCAP Grade 3 Evidence Statements

Reasoning - Calculators are available for all reasoning items

MCCRS Code	Evidence Statement	Clarifications
3.R.1	Base reasoning or explanations using a given pictorial representations and explains how the pictorial model represents a mathematical concept, or how it can be used to justify or refute a statement (with or without flaws) or how it can be used to generalize.	<ul style="list-style-type: none"> - Tasks provide visual (drawn) representations for students explain how a given visual representation represents a mathematic concept OR - Tasks provide a visual representation for students to explain how it can justify or refute a statement or reasoning OR - Tasks provide a given visual representation to make a conjecture or generalization. - Tasks should focus on content in standards that specify reasoning using visual mathematical representations (number lines, diagrams, and tables, etc.) <p>Type I Tasks - Must have a simple context to support reasoning for a 1-point task.</p> <ul style="list-style-type: none"> - May ask students to identify or select given reasoning that explains how the visual model represents a given mathematical concept - May ask students to use the visual model and select a statement or work that will justify or refute a given conjecture - May ask students to use the given visual model and select the correct generalization that the model proves is true <p>Type II Tasks- Must have context rich enough to support reasoning for a 3-point task.</p> <ul style="list-style-type: none"> - Constructed response tasks allow students provide work and/or a written explanation and/ or use the drawing tool to describe their own reasoning. - Tasks may prompt students to explain why the pictorial representations does or does not represent the mathematical concept or procedure; or to justify or refute an argument,
3.R.2	Identify flawed thinking/reasoning and explain how to correct the thinking or work.	<ul style="list-style-type: none"> - Tasks prompt students to identify the flaw in thinking/reasoning and explain how to correct the thinking or work <p>Type I Tasks- Must have a simple context to support a 1-point task</p> <ul style="list-style-type: none"> - Provide a statement or work with flawed thinking/reasoning and have students identify the flaw OR - Prompt students to select or identify given statements or work that describe how to correct the flaw. (could be correct work) <p>Type II Tasks- Must have context rich enough to support reasoning for a 3-point task.</p> <ul style="list-style-type: none"> - Constructed response tasks allows students to explain the flaw AND how to correct the flaw using written explanations with words, work, or use of the drawing tool to support or further explain their own reasoning.

MCAP Grade 3 Evidence Statements

MCCRS Code	Evidence Statement	Clarifications
3.R.3	Prove or disprove a statement, conjecture or generalization, using correct and precise mathematical examples (visual representation, words, symbols, equations or expressions)	<ul style="list-style-type: none"> Tasks should state a conjecture based on a mathematical concept that is either true or false. Students are then prompted to provide specific mathematically correct examples. Examples should be appropriate and precise. Tasks should require students to provide at least 2 and no more than 3 examples. Tasks should not provide or expect answers that are in the negative. <p>Type I Tasks - Must have a simple context with reasoning to support a 1-point task.</p> <ul style="list-style-type: none"> Provide a conjecture or generalization and ask students to select 2 examples that prove or disprove the statement Students may select examples that may be visual representation, words and symbols, equations or expressions to prove or disprove the conjecture. <p>Type II Tasks - Must have context rich enough to support reasoning for a 3-point task.</p> <ul style="list-style-type: none"> Constructed response tasks allow students to prove or disprove a statement, conjecture, or generalization with mathematical examples. Students provide at least two examples that may be visual representation, words and symbols, equations, or expressions.
3.R.4	Reason mathematically to create a correct and precise solution to a real-world problem and be able to explain why the answer is mathematically correct	<ul style="list-style-type: none"> The content scope of tasks is based on evidence statements that ask students to explain their thinking/reasoning to major mathematics concepts in the grade. <p>Type I Tasks - Must have real-world problems with simple context to support a 1-point task.</p> <ul style="list-style-type: none"> Tasks may ask students to identify the steps that would justify why the solution to a problem or a mathematical concept is true. Tasks could provide solution paths that describe the most common reasoning strategies and prompt students to select the correct solution path. <p>Type II Tasks - Must have context rich enough to support reasoning for a 3-point task.</p> <ul style="list-style-type: none"> Constructed response Type II tasks allow the students to provide their own solution path to justify why the solution to the problem is correct. Students should be prompted to represent their reasoning using complete and precise work, an explanation using words and or symbols, and/or the drawing tool.

MCAP Grade 3 Evidence Statements

Modeling - One-point items could be assessed using 3.M1-1, 3.M1-2, or 3.M.1-3. Three- point items could be assessed with 3.M.1-4 and/or 3.M.1-5 or a combination of two or more one-point evidence statements depending on the context of the problem situation. Calculators will be available for all modeling items.

MCCRS Code	Evidence Statement	Clarifications
3.M.1-1	Determine the problem that needs to be solved in a real-world, situation.	<ul style="list-style-type: none"> • Tasks do not require a solution. • Some tasks may include charts or graphs that could be analyzed for information about the problem. • Some tasks could require students to describe, in their own words, the problem that needs to be solved. (What is the problem that needs to be solved?) • Some tasks could provide a real-world situation without a question to solve and students would be prompted to create a question that could be asked based on the problem situation. • Some tasks could require students to restate the problem in their own words.
3.M.1-2	Determine the information that is needed to solve a problem in a given real-world situation. (What information is needed to solve the situation, no operations or a solution path is needed)	<ul style="list-style-type: none"> • Tasks do not require a solution, expressions, or equations. • Tasks may include charts or graphs that can be analyzed for information. • Some tasks may prompt students to identify the information, from a given problem, that is needed to solve the problem. • Some tasks may not provide all of the information needed to solve the problem. Students will make assumptions based on the information that is given in the problem
3.M.1-3	Identify the mathematics that is needed to create a solution path for areal-world, situation.(No solution path, just identify which operations will be needed to solve the problem)	<ul style="list-style-type: none"> • Tasks do not require a solution path with answers. Tasks could prompt the students to identify the sequence of operations needed to create a solution path. (For example, "First add then subtract" • Tasks could prompt students to identify or write an expression with the correct sequence of operations, write an equation with a letter for the answer, or write expressions. • Responses should be mathematically correct and precise.
3.M.1-4	Create a solution path that represents the mathematics needed to solve a real-world situation.	<ul style="list-style-type: none"> • Tasks must provide a problem scenario that allows for a solution path that shows two-steps. • Tasks should prompt students to represent a solution path using correct and precise mathematical representations. (words, symbols, drawings, etc.) • Tasks would require a complete and accurate solution path that includes the answer.
3.M.1-5	Evaluate a partial or complete solution to a real-world situation. (Check work)	<ul style="list-style-type: none"> • Tasks require students to analyze a given solution path (partial or complete) to determine if it is a mathematically correct solution path for the given real-world situation. If the solution path is correct, then students should explain why it is correct. • If the solution path is incorrect, students should be prompted to improve or refine the problem solution.

Grade 3 Math At-A-Glance 2022 – 2023

Units	Suggested Dates	Important Dates
<u>Unit 1: Math Tools and Multiplication</u> An active and collaborative learning environment is established. Students recall how to use variety of tools to solve math problems. Learn to tell time to the nearest minute and use models to calculate elapsed time. This unit lays foundation for developing multiplication and division strategies.	September 19 – October 14 20 Days (5 flex days)	September 5 – Labor Day September 6 – 16 Building Math Routines & Community MAP Testing
<u>Unit 2: Number Stories and Arrays</u> Students make sense of one-two step number stories involving all 4 operations. Represent situations with diagrams, arrays, pictures, words and number models through creating, sharing, comparing and interpreting representations. Improve problem solving strategies and further understanding that problems can be solved more than one way.	October 17 - November 16 19 Days (5 flex days)	October 20 – Early Dismissal – PD in PM October 21 – MSEA Convention November 7 – Early Dismissal November 8 – General election
<u>Unit 3: Operations</u> Students use place value to develop and practice strategies for addition and subtraction of 2 and 3 digit numbers. Represent multiplication using arrays and use these representations to develop strategies for solving multiplication fact.	November 17 - December 16 18 Days (3 flex days)	November 23 – 25 Thanksgiving December 19 -January 1 Winter Holiday
<u>Unit 4: Measurement and Geometry</u> Measure to nearest $\frac{1}{2}$ inch. Generate and represent data on a scaled line plot. Explore geometric attributes of polygons and classify quadrilaterals. Identify and measure perimeters of polygons and distinguish between Perimeter and area. Develop strategies for finding area of rectangles.	January 2 - February 1 21 Days (7 flex days)	January 16 MLK Day January 30 PD Day – no students MAP Testing
<u>Unit 5: Fractions and Multiplication Strategies</u> Students relate part-whole understanding of fractions to visual and symbolic representations and begin to explore fraction equivalence. They develop multiplication fact strategies by using arrays, area models and properties of multiplication.	February 2 - March 3 20 Days (7 flex days)	February 17 – Early Dismissal – PD in PM February 20 – President's Day
<u>Unit 6: More Operations</u> Students reflect on the more efficient and appropriate strategies for solving problems. They take inventory of the known multiplication facts that help them derive the remaining unknown facts. They model multistep stories with one or more equations and represent the unknown quantities with letters. Students are introduced to the order of operations.	March 6 - April 4 21 Days (8 flex days)	March 17 – Early Dismissal – PD in PM
<u>Unit 7: Fractions</u> Students revisit volume measurement and focus on comparing, estimating, and measuring liquid volumes. They continue to develop an understanding of fractions as numbers by exploring a new area fraction model and fractions as representations of distances on number lines.	April 11 - May 5 19 Days (5 flex days)	April 5 – Early Dismissal for students April 6-10 – Spring break
<u>Unit 8: Multiplication and Division</u> Students deepen and apply their understanding of multiplication, division, measurement, and attributes of shapes.	May 8 - May 26 15 Days (5 flex days)	MAP Testing
<u>Unit 9: Multi-Digit Operations</u> Students apply and extend many skills and concepts they have learned throughout the year to engaging, real-world contexts. Many of the activities in this unit can be extended over multiple days.	May 30 - EOY	May 29 – Memorial Day June 12-14 -1/2 day for students

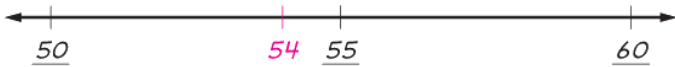
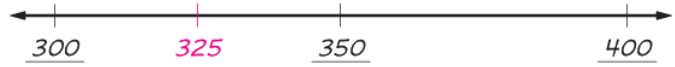
Grade 3 Math Standards	Units								
The following standards will appear in the Curriculum Document in the Units as marked.	1	2	3	4	5	6	7	8	9
3.OA.A.1. Interpret products of whole numbers, e.g., interpret 5×7 as the total number of objects in 5 groups of 7 objects each. <i>For example, describe a context in which a total number of objects can be expressed as 5×7.</i>	X	X	X		X	X	X		X
3.OA.A.2. Interpret whole-number quotients of whole numbers, e.g., interpret $56 \div 8$ as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each. <i>For example, describe a context in which a number of shares or a number of groups can be expressed as $56 \div 8$.</i>	X	X			X	X	X	X	X
3.OA.A.3. Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.	X	X	X		X	X	X	X	X
3.OA.A.4. Determine the unknown whole number in a multiplication or division equation relating three whole numbers. <i>For example, determine the unknown number that makes the equation true in each of the equations $8 \times ? = 48$, $5 = _ \div 3$, $6 \times 6 = ?$</i>		X	X		X	X		X	X
3.OA.B.5. Apply properties of operations as strategies to multiply and divide. ² <i>Examples: If $6 \times 4 = 24$ is known, then $4 \times 6 = 24$ is also known. (Commutative property of multiplication.) $3 \times 5 \times 2$ can be found by $3 \times 5 = 15$, then $15 \times 2 = 30$, or by $5 \times 2 = 10$, then $3 \times 10 = 30$. (Associative property of multiplication.) Knowing that $8 \times 5 = 40$ and $8 \times 2 = 16$, one can find 8×7 as $8 \times (5 + 2) = (8 \times 5) + (8 \times 2) = 40 + 16 = 56$. (Distributive property.)</i>		X	X		X	X			X
3.OA.B.6. Understand division as an unknown-factor problem. <i>For example, find $32 \div 8$ by finding the number that makes 32 when multiplied by 8.</i>	X				X	X		X	X
3.OA.C.7. Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that $8 \times 5 = 40$, one knows $40 \div 5 = 8$) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.	X	X	X	X	X	X	X	X	X
3.OA.D.8. Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.		X	X	X	X	X	X		
3.OA.D.9. Identify arithmetic patterns (including patterns in the addition table or multiplication table) and explain them using properties of operations. <i>For example, observe that 4 times a number is always even, and explain why 4 times a number can be decomposed into two equal addends.</i>		X	X		X	X			X
3.NBT.A.1. Use place value understanding to round whole numbers to the nearest 10 or 100.	X		X						
3.NBT.A.2. Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.	X	X	X		X	X	X	X	X
3.NBT.A.3. Multiply one-digit whole numbers by multiples of 10 in the range 10–90 (e.g., 9×80 , 5×60) using strategies based on place value and properties of operations.							X	X	X

The following standards will appear in the Curriculum Document in the Units as marked.	1	2	3	4	5	6	7	8	9
3.NF.A.1. Understand a fraction $1/b$ as the quantity formed by 1 part when a whole is partitioned into b equal parts; understand a fraction a/b as the quantity formed by a parts of size $1/b$.	X	X			X		X	X	
3.NF.A.2. Understand a fraction as a number on the number line; represent fractions on a number line diagram. a) Represent a fraction $1/b$ on a number line diagram by defining the interval from 0 to 1 as the whole and partitioning it into b equal parts. Recognize that each part has size $1/b$ and that the endpoint of the part based at 0 locates the number $1/b$ on the number line. b) Represent a fraction a/b on a number line diagram by marking off a lengths $1/b$ from 0. Recognize that the resulting interval has size a/b and that its endpoint locates the number a/b on the number line.				X			X	X	
3.NF.A.3. Explain equivalence of fractions in special cases and compare fractions by reasoning about their size. a) Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line. b) Recognize and generate simple equivalent fractions, e.g., $1/2 = 2/4$, $4/6 = 2/3$. Explain why the fractions are equivalent, e.g., by using a visual fraction model. c) Express whole numbers as fractions and recognize fractions that are equivalent to whole numbers. <i>Examples: Express 3 in the form $3 = 3/1$; recognize that $6/1 = 6$; locate $4/4$ and 1 at the same point of a number line diagram.</i> d) Compare two fractions with the same numerator or the same denominator by reasoning about their size. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with the symbols $>$, $=$, or $<$, and justify the conclusions, e.g., by using a visual fraction model.					X		X	X	
3.MD.A.1. Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram.	X						X		X
3.MD.A.2. Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). ¹ Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem.	X	X		X			X		X
3.MD.B.3. Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step “how many more” and “how many less” problems using information presented in scaled bar graphs. <i>For example, draw a bar graph in which each square in the bar graph might represent 5 pets.</i>	X		X						X

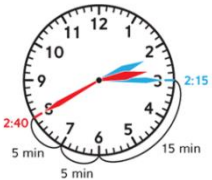
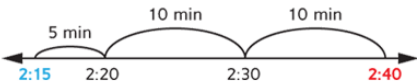
Grade 3 Math Standards	Units								
The following standards will appear in the Curriculum Document in the Units as marked.	1	2	3	4	5	6	7	8	9
3.MD.B.4. Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units—whole numbers, halves, or quarters.	X			X		X		X	
3.MD.C.5. Recognize area as an attribute of plane figures and understand concepts of area measurement. a) A square with side length 1 unit, called “a unit square,” is said to have “one square unit” of area, and can be used to measure area. b) A plane figure which can be covered without gaps or overlaps by n unit squares is said to have an area of n square units.		X	X	X					
3.MD.C.6. Measure areas by counting unit squares (square cm, square m, square in, square ft, and improvised units).		X	X	X	X				
3.MD.C.7. Relate area to the operations of multiplication and addition. a) Find the area of a rectangle with whole-number side lengths by tiling it and show that the area is the same as would be found by multiplying the side lengths. b) Multiply side lengths to find areas of rectangles with whole-number side lengths in the context of solving real world and mathematical problems and represent whole-number products as rectangular areas in mathematical reasoning. c) Use tiling to show in a concrete case that the area of a rectangle with whole-number side lengths a and $b + c$ is the sum of $a \times b$ and $a \times c$. Use area models to represent the distributive property in mathematical reasoning. d) Recognize area as additive. Find areas of rectilinear figures by decomposing them into non-overlapping rectangles and adding the areas of the non-overlapping parts, applying this technique to solve real world problems.			X	X	X	X		X	
3.MD.D.8. Solve real world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters.				X	X	X			
3.G.A.1. Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.	X			X		X		X	X
3.G.A.2. Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole. <i>For example, partition a shape into 4 parts with equal area, and describe the area of each part as $\frac{1}{4}$ of the area of the shape.</i>	X	X	X		X		X	X	X

Grade 3 Unit One Math Tools, Time, and Multiplication

Grade 3 Unit One Math Tools, Time, and Multiplication																																																																								
Connections/Notes		Additional Resources																																																																						
Lesson 1-1 Number Grids and Lesson 1-2 Introducing the Student Reference Book																																																																								
3.NBT.A.2. Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.																																																																								
Lesson 1-1 Students use number-grid (120 chart) patterns for computation. Students will use these patterns to find missing numbers in the grid and to add or subtract 2-digit numbers.		3.NBT.A.2. Teaching Student Centered Mathematics Activities for Flexible Thinking with Whole Numbers pg. 51-53																																																																						
<table><tr><td>21</td><td>22</td><td>23</td><td>24</td><td>25</td><td>26</td><td>27</td><td>28</td><td>29</td><td>30</td></tr><tr><td>31</td><td>32</td><td>33</td><td>34</td><td>35</td><td>36</td><td>37</td><td>38</td><td>39</td><td>40</td></tr><tr><td>41</td><td>42</td><td>43</td><td>44</td><td>45</td><td>46</td><td>47</td><td>48</td><td>49</td><td>50</td></tr><tr><td>51</td><td>52</td><td>53</td><td>54</td><td>55</td><td>56</td><td>57</td><td>58</td><td>59</td><td>60</td></tr><tr><td>61</td><td>62</td><td>63</td><td>64</td><td>65</td><td>66</td><td>67</td><td>68</td><td>69</td><td>70</td></tr><tr><td>71</td><td>72</td><td>73</td><td>74</td><td>75</td><td>76</td><td>77</td><td>78</td><td>79</td><td>80</td></tr><tr><td>81</td><td>82</td><td>83</td><td>84</td><td>85</td><td>86</td><td>87</td><td>88</td><td>89</td><td>90</td></tr></table>	21		22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	<p>Example: Find 54 more than 31.</p> <p>Point to 31. Count 50 more by 10s saying 41, 51, 61, 71, 81. Then count 4 more saying 82, 83, 84, and 85. So, 54 more than 31 is 85.</p>
21	22		23	24	25	26	27	28	29	30																																																														
31	32		33	34	35	36	37	38	39	40																																																														
41	42		43	44	45	46	47	48	49	50																																																														
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71	72	73	74	75	76	77	78	79	80																																																															
81	82	83	84	85	86	87	88	89	90																																																															
Common Misconception: To avoid having children count the start number as 1 (when counting by 1s) or as 10 (when counting by 10s), have them place counter on the start numbers. Then have children move their fingers to the next number to begin their counts. They may also draw hops to each new space to signal counting by 1s or 10s (using the number grid).																																																																								
Lesson 1-2 Students will explore the <i>Student Reference Book</i> and play the <i>Number-Grid Difference</i> game.																																																																								
Lesson 1-3 Tools for Mathematics																																																																								
3.MD.A.1. Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram.																																																																								
3.MD.B.4. Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units—whole numbers, halves, or quarters. Measure using inches and centimeters.																																																																								
3.G.A.1. Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals).																																																																								
Lesson 1-3 Students review and use a variety of math tools. (Clock, calculator, pattern block template, and ruler) This lesson provides an opportunity to develop routines for using tools, as well as a review of telling time to the nearest hour, half hour, and 5 minutes. Telling time to the minute is taught in Lesson 1-5.		Review for 3.MD.A.1. Greg Tang Lesson 28 – Tell & Write Time																																																																						
Common Misconception: Remind students that the actual lengths of standard units, such as inch and centimeter, never change. Measurement tools on screens may display units as larger or smaller than in																																																																								

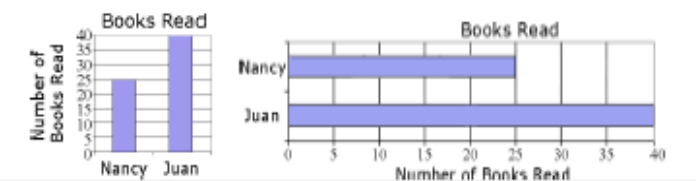
Grade 3 Unit One Math Tools, Time, and Multiplication	
Connections/Notes	Additional Resources
<p><i>real life. Ask children to compare the length of an inch and centimeter on their rulers to the length of the displayed inch and centimeter for clarification.</i></p> <p>Review of Grade 2 Standards</p> <p>Lesson 1-4 Number Lines and Rounding</p> <p>3.NBT.A.1 Use place value understanding to round whole numbers to the nearest 10 or 100.</p> <p>3.NBT.A.2 Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.</p>	
<p>Lesson 1-4 Students use open number lines to round numbers.</p> <p>Strategies for adding and subtracting 2-digit and 3-digit numbers will be reviewed in this lesson. Rounding can help with estimation. This lesson introduces a common rounding method that involves rounding to the nearest 10 or 100. The traditional version of this algorithm involves rounding up if the digit to the right of the target place is 5 or greater and rounding down if the digit is less than 5. The focus in this lesson is rounding 2-digit numbers to nearest ten and 3-digit numbers to nearest hundred.</p> <p>3.NBT.A.1 Example: Round 54 to the nearest 10.</p>  <p>Example: Round 325 to the nearest 100.</p>  <p>Remind children that an estimate is an answer close to an exact answer. An estimate can also be used to get an idea ahead of time what a reasonable answer might be. This is true for number-story problems and for problems without stories, like those in the Math Message.</p> <p>Remind children that one way to estimate is to identify close-but-easier numbers and then add or subtract them.</p> <p>Common Misconception: Some children may think that the closest multiples of 100 to 325 are 200 and 300. Help them to realize that because 325 is greater than 300, the closest multiples are 300 and 400.</p>	<p>3.NBT.A.1. <u>Teaching Student Centered Mathematics</u> Rounding, pg. 47</p> <p><u>Lessons</u> All Aboard for Rounding Round Two Digit Measurement on Vertical Number Line Round Two and Three Digit Numbers on a Vertical Number Line</p> <p><u>Activities and Tasks</u> Round to the Nearest Ten Game Round to the Nearest Hundred Game Rounding to 50 or 500 Rounding to the Nearest 10 and 100 (IM Task)</p> <p><u>Templates and Visuals</u> Rounding Template Estimation Chart</p>

Grade 3 Unit One Math Tools, Time, and Multiplication

Connections/Notes	Additional Resources
<p>Grade 2 addition and subtraction strategies for 3-digit numbers may be reviewed in this lesson. Students will use their rounding skills later in Unit 3 to assess the reasonableness of answers using mental computation and estimation strategies.</p> <p>3.NBT.A.1</p> <p>MCAP Evidence Statement: The language of the standard should guide the creation of assessment tasks, including the ideas in the given examples.</p> <p>Clarifications:</p> <ul style="list-style-type: none"> • Tasks have little to no context. • Tasks should allow students to apply strategies of rounding numbers to the nearest 10 and 100. • Tasks should provide several examples of rounding two-and three-digit numbers and ask students to identify and describe place value patterns that result. • Tasks should involve rounding numbers to the nearest 10 or 100 using a number line. 	
<p>Lesson 1- 5 Time, and Lesson 1- 6 How Long is a Morning? Open Response and Reengagement 2 Days</p> <p>3.MD.A.1. Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram.</p>	
<p>Lesson 1-5 Students tell time to the nearest minute and calculate elapsed time.</p> <p>Students in second grade learned to tell time to the nearest five minutes. In third grade, they extend telling time to the nearest minute and measure elapsed time both in and out of context using clocks and number lines.</p> <div style="text-align: center;">   </div> <p>In subsequent lessons, children will tell and write the time at the top of each journal page. This routine provides daily practice for telling time.</p> <p>Common Misconception: Watch for children who struggle to read time when the minute hand is in the last quadrant of the clock. For example, they may read 5:55 as 6:55 because the hour hand is almost at 6. Have them use hour-hand only clocks (remove the minute hand from a clock on Math Masters, page TA4) along with their two-handed clocks. Have children suggest an approximate time with the hour-hand clock, such as a little past 10, almost 1 o'clock, and halfway between 4 and 5 o'clock. Next give a</p>	<p>3.MD.A.1.</p> <p>Teaching Student Centered Mathematics</p> <p>Measuring Time, pgs. 269-270</p> <p>Elapsed Time, pgs. 270-271</p> <p>Lessons</p> <p>Telling Time Using a Number Line</p> <p>Telling Time to the Nearest Minute</p> <p>Lesson Solve Word Problems within one hour</p> <p>Activities and Tasks</p> <p>*Substitute Task</p> <p>Elapsed Time Word Problems</p> <p>Later and Earlier</p> <p>Elapsed Time within 1 Hour</p>

Grade 3 Unit One Math Tools, Time, and Multiplication	
Connections/Notes	Additional Resources
<p><i>more exact time that corresponds with the hour-hand clock, such as 10:07, 9:56, and 4:28. Have children position the hour and minute hands on the two-handed clock.</i></p> <p>3.MD.A.1. MCAP Evidence Statement: Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing problem on a number line diagram.</p> <p>Clarifications: Part 1 Telling and writing time to the nearest minute and measure time intervals in minutes.</p> <ul style="list-style-type: none"> • <i>Tasks could involve telling and writing time to the nearest minute.</i> • <i>Time intervals are limited to 60 minutes.</i> • <i>Acceptable time interval: Start time 1:20. End time 2:10. Total time interval is 50 minutes which is within the 60-minute interval requirement.</i> • <i>Unacceptable interval: Start time 1:20. End time 2:30. Total time interval exceeds 60 minutes.</i> <p>Part 2 Solving addition and subtraction word problems with time intervals in minutes.</p> <ul style="list-style-type: none"> • <i>See above for acceptable time interval limits.</i> • <i>Tasks may show an open number line diagram for students to use to solve the problem.</i> • <i>This evidence statement measures time intervals or elapsed time. Elapsed time is time that has passed. Tasks may include a start or end time and the amount of time that passes to find the end or start time.</i> <p>Example 1: Given start and end time, find the amount of time in between start and end time. (David has a lot of homework to do. He starts his reading homework at 3:30 and ends at 3:55. Then he does math from 3:55 until 4:25. How much total time did David spend on his homework?)</p> <p>Example 2: Given the start time and the time in between, find end time. (David got home from school at 4:00. He played outside for 30 minutes and did homework for 25 minutes. What time is it?)</p> <p>Example 3: Given time in between the start and end time and given end time, find start time (Ian went to the library and stayed at the library for 25 minutes. He left the library at 2:30. What time did he arrive at the library?)</p> <p>Lesson 1-6 Open Response and Reengagement Lesson *This is the first Open Response and Reengagement lesson in Grade 3. These two-day lessons appear in each unit to provide students consistent opportunities to engage in the Mathematical Practices as they solve</p>	<p><u>Template</u> Elapsed Time Ruler</p>

Grade 3 Unit One Math Tools, Time, and Multiplication


Connections/Notes	Additional Resources
<p>problems. In these lessons, students solve an open response problem on Day 1 and reengage with the same problem on Day 2 to deepen their understanding of the content and practices.</p> <p>*Because this EM4 Lesson goes beyond the scope of the MCAP clarification, a different task will be substituted that remains within the 60 minutes of elapsed time. This revised lesson can be found in your grade level Google shared drive in the Unit 1 Resources folder.</p> <p>Day 1: Students use mathematical models to measure elapsed time. Common Misconceptions: Watch for children who incorrectly count the total time. For example, when calculating the time from 8:45 to 11:30, some children may incorrectly think that 3 hours have passed from 8:00 to 11:00. Use an open number line or clock to help them recount and look for familiar times.</p> <p>Day 2: Students share models and discuss strategies for calculating elapsed time, and then revise their work.</p>	
<p>Lesson 1-7 Scaled Bar Graphs 3.MD.B.3 Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step “how many more” and “how many less” problems using information presented in scaled bar graphs. <i>For example, draw a bar graph in which each square in the bar graph might represent 5 pets.</i></p>	
<p>Lesson 1-7 Students represent and interpret data on scaled bar graphs.</p> <p>In EM4, students participate in data collection and analysis. In Lesson 1-7, students collect, organize, and analyze data about how many letters are in their first and last names. They review elements of a scaled bar graph in preparation for more in-depth work with graphs in Unit 3. Students should have opportunities to interpret both horizontal and vertical bar graphs.</p> <div style="text-align: center;">  </div> <p>3.MD.B.3 MCAP Evidence Statement: The language of the standard should guide the creation of assessment tasks, including the ideas in the given examples. Clarifications:</p> <ul style="list-style-type: none"> Tasks will engage students in constructing, reading, and interpreting bar and picture graphs. 	<p>3.MD.B.3. Teaching Student Centered Mathematics Bar Graphs, pg. 331</p> <p>Activities and Tasks Jake's Survey</p> <p>Videos Learn Zillion Videos now on YouTube: -Draw Bars on a Graph -Determine Scale Increments</p>

Grade 3 Unit One Math Tools, Time, and Multiplication

Connections/Notes	Additional Resources
<ul style="list-style-type: none"> Tasks will include problem types that are one-step and two-step “how many less” and “how many more” problems. The graph will provide information for the problem. Tasks that involve using a scaled bar graph, (e.g. On a bar graph each square that represents a data point is greater than 1) Tasks involve no more than 10 data points in 2-5 categories. Categorical data should not take the form of a category that should be represented numerically (e.g. do not use ages of students). Tasks do not require students to create the entire graph but might ask students to complete a graph or otherwise demonstrate knowledge of its creation. Tasks do not require computations beyond the grade 3 expectations. 	
<p>Lesson 1-8 Multiplication Strategies (2 Days)</p> <p>3.OA.A.1. Interpret products of whole numbers, e.g., interpret 5×7 as the total number of objects in 5 groups of 7 objects each. <i>For example, describe a context in which a total number of objects can be expressed as 5×7.</i></p> <p>3.OA.A.3. Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.</p> <p>3.OA.C.7. Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that $8 \times 5 = 40$, one knows $40 \div 5 = 8$) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.</p>	
<p>Lesson 1-8 Students use drawings and number models to represent and solve multiplication number stories. During this lesson, introduce the Fact Strategy Wall as a place to record strategies for solving multiplication and division problems. Record children’s suggestions on the Fact Strategy Wall under a heading for today’s focus, such as “Strategies for Equal-Groups Problems.” Encourage children to refer to the Fact Strategy Wall to help them choose efficient strategies as they complete the problems in the next activity.</p> <div style="text-align: center;"> <p><u>Fact Strategy Wall</u></p> <p><i>Strategies for Equal-Groups Problems</i></p> <p>groups ○○○○○○</p> <p>arrays ●● ●● ●● ●●</p> <p>addition $2 + 2 + 2 + 2 + 2 + 2 = 12$</p> <p>skip counting</p> </div> <p>3.OA.A.3 Multiplication and division word problems may be represented in multiple ways:</p> <ul style="list-style-type: none"> Equations: $3 \times 4 = \underline{\quad}$, $4 \times 3 = \underline{\quad}$, $12 \div 4 = \underline{\quad}$ and $12 \div 3 = \underline{\quad}$ 	<p>3.OA.A.1. Teaching Student Centered Mathematics Developing Multiplication and Division Operation Sense, pp. 56 - 71</p> <p>Lessons Relate Multiplication to the Array Understand Equal Groups as Multiplication Interpret the meaning of Factors</p> <p>Activities and Tasks Multiple Arrays</p>

Grade 3 Unit One Math Tools, Time, and Multiplication

Connections/Notes

- Arrays: 

- Equal groups

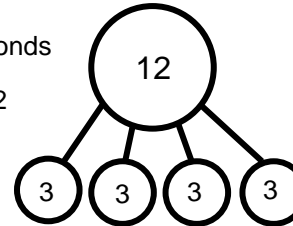
- Repeated addition: $4 + 4 + 4$ or repeated subtraction

Starting	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6
24	$24-4=$ 20	$20-4=$ 16	$16-4=$ 12	$12-4=$ 8	$8-4=$ 4	$4-4=$ 0



Number Bonds

$$4 \times 3 = 12$$

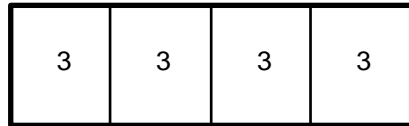


- Three equal jumps forward from 0 on the number line to 12 or three equal jumps backwards from 12 to 0



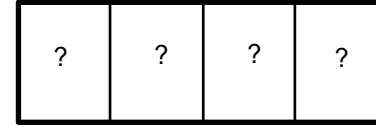
- Bar Models

$$4 \times 3 =$$



?

$$12 \div 4$$



12

3.OA.A.1 Students recognize multiplication as a means to determine the total number of objects when there are a specific number of groups with the same number of objects in each group. Multiplication requires students to think in terms of groups of things rather than individual things. Students learn that the multiplication symbol “x” means groups of - such as 5×7 refers to 5 groups of 7.

To further develop this understanding, students interpret a problem situation requiring multiplication using pictures, objects, words, numbers, and equations. Then, given a multiplication expression (e.g., 5×6) students interpret the expression using a multiplication context. They should begin to use the terms *factor* and *product*, as they describe multiplication.

Common Misconception: Although multiplication is commutative (for example, $3 \times 2 = 6$ and $2 \times 3 = 6$), in equal groups situations the meaning of the factors does matter: For example, if a context involves 3 bowls with 4 oranges in each bowl, children might record 3×4 to be read as “3 groups of 4,” not as “4 groups of 3.” If children are inconsistent in their designation of groups and amount per group, help them connect their work with the number story context and clearly label the parts of their sketches.

Additional Resources

Array Picture Cards

3.OA.A.3.

Activities and Tasks

Number Story Arrays

Multiplication Word Problems

Online

[Thinking Blocks for Bar Modeling](#)

Templates and Visuals

Template for Story Structures

Strategies for Multiplication

Grade 3 Unit One Math Tools, Time, and Multiplication

Connections/Notes				Additional Resources
<p>3.OA.A.1. MCAP Evidence Statement: The language of the standard should guide the creation of assessment tasks, including the ideas in the given examples. Clarifications:</p> <ul style="list-style-type: none"> <i>The intent of this standard is to interpret multiplication expressions and equations using the definition of multiplication as stated in the standard. It is not to assess calculating products.</i> <i>Tasks involve interpreting products rather than calculating products in terms of equal groups, arrays, area, and/or measurement quantities. All four representations listed should be used in tasks, not just equal groups.</i> <i>Task context should be aligned to the equal parts problem types shown in the Multiplication and Division Situations table (see below)</i> 				
Problem Situation	Unknown Product	Unknown Factor (Group size)	Unknown Factor (Number of groups)	
Equal Groups of Objects	Unknown Product There are A bags with B plums in each bag. How many plums are there in all?	Group Size Unknown If C plums are shared equally into A. There are C plums with A plums in each bag. How many plums are in each bag (b)?	Number of Groups Unknown If C plums are shared equally into A. There are C plums with the same number of plums in each bag (A). How many bags are filled with A number in each bag?	

Grade 3 Unit One Math Tools, Time, and Multiplication

Connections/Notes	Additional Resources
<p>MCAP Sample Question:</p> <div style="border: 1px solid black; padding: 10px; margin: 10px 0;"> <p>A baker has 48 cupcakes to deliver. The baker puts 6 cupcakes in each box.</p> <p>Which equations represent the number of boxes the baker needs to deliver all 48 cupcakes?</p> <p>Select the three correct answers.</p> <p><input type="checkbox"/> A. $48 \div \square = 6$</p> <p><input type="checkbox"/> B. $48 \times 6 = \square$</p> <p><input type="checkbox"/> C. $6 \times \square = 48$</p> <p><input type="checkbox"/> D. $48 \div 6 = \square$</p> <p><input type="checkbox"/> E. $6 + \square = 48$</p> <p><input type="checkbox"/> F. $6 + 48 = \square$</p> </div> <p>3.OA.A.3 MCAP Evidence Statement: For assessment, this standard has been divided into two sections one for each operation. 3.OA.A.3-1 only focuses on multiplication within 100 with both factors being less than or equal to 10 The intent of the standard is for students to solve word problem types listed in the table of Multiplication and Division Situations found in the back of this document. Clarifications for both multiplication and division:</p> <ul style="list-style-type: none"> • Tasks should not include a symbol for the unknown. This concept will be assessed in 3.OA.A.4 using a symbol for the unknown. • Tasks should require students to represent the context of a multiplication or division problem with a correct equation. (Answers must be given.) • Context may include word and/or an assortment of visual models using equal groups, arrays, or area models. • Must have context for a single-step word problem. • If students are asked to identify the equation that matches the problem situation, a variety of equation representations should be used, such as ($5 \times 8 = 40$ or $40 = 5 \times 8$, etc.) 	
<p>Lesson 1- 9 Introducing Division - 2 Days 3.OA.A.2. Interpret whole-number quotients of whole numbers, e.g., interpret $56 \div 8$ as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each. <i>For example, describe a context in which a number of shares or a number of groups can be expressed as $56 \div 8$.</i></p>	

Grade 3 Unit One Math Tools, Time, and Multiplication	
Connections/Notes	Additional Resources
<p>3.OA.A.3. Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.</p> <p>3.OA.B.6. Understand division as an unknown-factor problem. <i>For example, find $32 \div 8$ by finding the number that makes 32 when multiplied by 8.</i></p>	
<p>Students are introduced to division as they solve division number stories.</p> <p>In this lesson, students are introduced to representations of equal-sharing and equal-grouping situations.</p> <p>3.OA.A.2 Students recognize the operation of division in two different types of situations. One situation requires determining how many groups and the other situation requires sharing (determining how many in each group). Students should be exposed to appropriate terminology (quotient, dividend, and divisor). These terms will be fully taught in lesson 2.9.</p> <p>To develop this understanding, students interpret a problem situation requiring division using pictures, objects, words, numbers, and equations. Given a division expression (e.g., $24 \div 6$) students interpret the expression in contexts that require both interpretations of division.</p> <p>Partition models provide students with a total number and the number of groups. These models focus on the question, "How many objects are in each group so that the groups are equal?" A context for partition models would be: There are 12 cookies on the counter. If you are sharing the cookies equally among three bags, how many cookies will go in each bag?</p> <p>Measurement models provide students with the total number of shares and the number in each group. A context for measurement models would be: Max the monkey loves bananas. Molly, his trainer, has 24 bananas. If she gives Max 4 bananas each day, how many days will the bananas last?</p> <p>Common Misconception: <i>Watch for children who misinterpret the known and missing quantities. For example, to solve Problem 1 on journal page 18 some children may create 3 groups of 5 instead of 5 groups of 3. Although the resulting answer is still 5, the interpretation is inconsistent with the context. Assist children by suggesting they first decide which is known: the number of groups or the number in each group.</i></p> <p>3.OA.A.2 MCAP Evidence Statement: The language of the standard should guide the creation of assessment tasks, including the ideas in the given examples.</p>	<p>3.OA.A.2. <u>Teaching Student Centered Mathematics</u> Developing Multiplication and Division Operation Sense pg. 56 - 71</p> <p><u>Activities and Tasks</u> Planting Seeds Activity Sharing or Grouping Fish Tanks (IM) Markers in Boxes Two Interpretations of Division</p> <p><u>Lessons</u> Divide Equal Groups Interpret the Unknown Understand the Meaning of the Unknown</p> <p><u>Videos</u> Learn Zillion Videos now on YouTube: Solve Division Problems by Drawing Pictures Divide Using a Share Model</p> <p>3.OA.A.3 <u>Activities and Tasks</u> Gifts from Grandma</p>

Grade 3 Unit One Math Tools, Time, and Multiplication

Connections/Notes


Clarifications:


- The intent of this standard is to interpret division expressions and equations using the definition of division as stated in the standard. It is not to assess calculating quotients.
- Tasks involve interpreting quotients rather than calculating quotients in terms of equal groups, arrays, area, and/or measurement quantities. - See the table for Multiplication and Division Situations found on page 18 of this document.
- Tasks involve interpreting quotients rather than calculating quotients in terms of equal groups, arrays, area, and/or measurement quantities. All representations should be used in tasks, not just equal groups.
- Half the tasks require interpreting quotients as a number of objects in each share and half require interpreting quotients as a number of equal shares. (Both Partitive and Measurement division types)

3.OA.A.3.

Multiplication and **division** word problems may be represented in multiple ways:

- Equations: $3 \times 4 = \underline{\quad}$, $4 \times 3 = \underline{\quad}$, $12 \div 4 = \underline{\quad}$ and $12 \div 3 = \underline{\quad}$

- Array: 

- Equal groups 

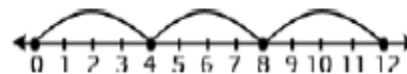
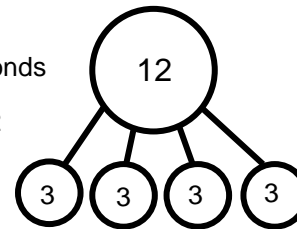
- Repeated addition: $4 + 4 + 4$ or repeated subtraction

Starting	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6
24	$24 - 4 =$	$20 - 4 =$	$16 - 4 =$	$12 - 4 =$	$8 - 4 =$	$4 - 4 =$
	20	16	12	8	4	0

- Three equal jumps forward from 0 on the number line to 12 or three equal jumps backwards from 12 to 0

Number Bonds

$$4 \times 3 = 12$$



Additional Resources

Online

[Thinking Blocks for Bar Modeling](#)

Templates and Visuals

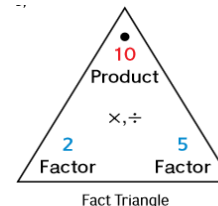
Template for Story Structures
Division 5 Ways

Grade 3 Unit One Math Tools, Time, and Multiplication

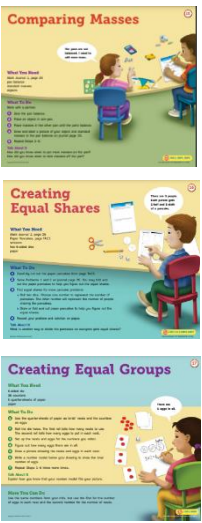
Grade 3 Unit One Math Tools, Time, and Multiplication									
Connections/Notes	Additional Resources								
<ul style="list-style-type: none">Bar Models <div><div>4 x 3 =</div><table><tr><td>3</td><td>3</td><td>3</td><td>3</td></tr></table><div>?</div><div>12 ÷ 4</div><table><tr><td>?</td><td>?</td><td>?</td><td>?</td></tr></table><div>12</div></div>	3	3	3	3	?	?	?	?	
3	3	3	3						
?	?	?	?						
<p>Lesson 1-10 Foundational Multiplication Facts</p> <p>3.OA.A.1. Interpret products of whole numbers, e.g., interpret 5 × 7 as the total number of objects in 5 groups of 7 objects each. <i>For example, describe a context in which a total number of objects can be expressed as 5 × 7.</i></p> <p>3.OA.B.6. Understand division as an unknown-factor problem. <i>For example, find 32 ÷ 8 by finding the number that makes 32 when multiplied by 8.</i></p> <p>3.OA.C.7. Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that 8 × 5 = 40, one knows 40 ÷ 5 = 8) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.</p> <p>3.NBT.A.2. Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.</p>									
<p>Lesson 1-10 Students develop strategies for 2s, 5s, and 10s facts.</p> <p>Students will be introduced to Quick Looks in this lesson. Quick Looks lay a foundation for learning basic facts because they encourage children to subitize, or instantly recognize a small quantity without counting. Quick Looks will be used throughout the year to encourage children to make sense of array or equal-groups images and practice multiplication facts.</p> <p>Most Quick Looks involve arrays or equal groups, which encourage students to utilize skip-counting, repeated addition, or instant recognition to build their understanding of multiplication.</p> <p>The 2s, 5s, and 10s are foundational facts because they are “helper facts” for more sophisticated strategies in future units. Through strategy development and practice such as solving number stories, discussions, Quick Looks, and games, students will develop automaticity with all multiplication facts.</p> <p>Students need ample opportunities to observe and identify important numerical patterns related to operations. They should build on their previous experiences with properties related to addition and subtraction. Students investigate multiplication tables in search of patterns and explain why these patterns make sense mathematically. For example:</p> <ul style="list-style-type: none">The doubles (2 addends the same) in an addition table fall on a diagonal while the doubles (multiples of 2) in a multiplication table fall on horizontal and vertical lines.	<p>3.OA.C.7. (x2, x5, x10) Teaching Student Centered Mathematics Strategies for Multiplication Facts, pg. 88</p> <p>Activities and Tasks Clock Flash Cards for the Fives I Have Who Has x2 and x5 Multiplication Challenge (2, 5, 10) Multiplication Number Wheel (2, 5, 10)</p> <p>3.OA.B.6. Lessons Model Division as the Unknown Factor in Multiplication Interpret the Quotient (2s)</p>								

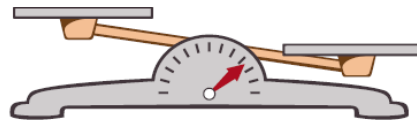
Grade 3 Unit One Math Tools, Time, and Multiplication

Connections/Notes	Additional Resources
<ul style="list-style-type: none"> All the multiples of 5 end in a 0 or 5 while all the multiples of 10 end with 0. Every other multiple of 5 is a multiple of 10. <p>3.OA.C.7</p> <p>MCAP Evidence Statement: For assessment, this standard is divided by operation. 3.OA.C.7-1 tasks will only address multiplication within 100 for fluency. The word fluency does not mean instant recall (automaticity). Fluency means the recall of facts involves accuracy, efficiency, and flexibility. The standard focuses on the strategies commonly used to find the products.</p> <p>Clarifications:</p> <ul style="list-style-type: none"> Tasks assess the entire standard except for the last sentence, “By end of grade 3, know from memory all products of two one-digit numbers. Tasks do not have a context. Tasks are not timed. Tasks may include how the mental math strategies, properties of operations, or relationships between and among operations are used to multiply whole numbers with factors with products within 100. This standard should only be used for content problems. This standard is not appropriate as the content focus for reasoning and modeling tasks since a calculator is available for computation on modeling and reasoning tasks. <p>Add to Fact Strategy Wall:</p> <p>Strategies for multiplying by 2s, 5s, and 10s:</p> <p>2s: Think of the addition double.</p> <p>10s: Skip count by 10s; add 10 more each time.</p> <p>5s: Skip count by 5s; add 5 more each time; find half of the same x10 problem.</p> <p>Have children who are fluent with 2s, 5s, and 10s facts do further work to show that the product of a number and 5 is always half of the product of that same number and 10. For example, ask: <i>If you know that $5 \times 4 = 20$, how can you figure out what 10×4 is?</i> You can just double it because 5 is half of 10. Then have children generate more examples and explain why they think this rule always works.</p> <p>Fact Triangles are introduced in this lesson. Multiplication and division are inverse operations and that understanding can be used to find the unknown. Fact family triangles demonstrate the inverse operations of multiplication and division by showing the two factors and how those factors relate to the product and/or quotient (2s, 5s, and 10s).</p>	<p>Activities and Tasks</p> <p>Division as Unknown Factor Problems</p> <p>Learn Zillion Videos now on YouTube:</p> <p>Division Using Equal Groups Interpret Division Unknown Factor Problem Using Arrays</p>



Grade 3 Unit One Math Tools, Time, and Multiplication	
Connections/Notes	Additional Resources
Lesson 1-11 The Length-of-Day Project (see message below – only complete parts of this lesson) 3.MD.A.1. Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram.	
Lesson 1-11 Students calculate elapsed time. <i>*It is recommended to complete all activities in this lesson except for “Length of Day Project.” The project is optional, as it extends beyond the scope of the MCAP clarifications.</i> 3.MD.A.1 MCAP Evidence Statement: The language of the standard should guide the creation of assessment tasks, including the ideas in the given examples. There are two concepts in this standard. Clarifications: Part 1 Telling and writing time to the nearest minute and measure time intervals in minutes. <ul style="list-style-type: none"> Tasks could involve telling and writing time to the nearest minute. Time intervals are limited to 60 minutes. Acceptable time interval: Start time 1:20. End time 2:10. Total time interval is 50 minutes which is within the 60-minute interval requirement. Unacceptable interval: Start time 1:20. End time 2:30. Total time interval exceeds 60 minutes. Part 2 Solving addition and subtraction word problems with time intervals in minutes. <ul style="list-style-type: none"> See above for acceptable time interval limits. Tasks may show an open number line diagram for students to use to solve the problem. This evidence statement measures time intervals or elapsed time. Elapsed time is time that has passed. Tasks may include a start or end time and the amount of time that passes to find the end or start time. *Refer to Lesson 1-5 in this document for examples.	3.MD.A.1. <u>Activities and Tasks</u> Elapsed Time with Gingerbread Baby <u>Templates</u> Elapsed Time Ruler
Lesson 1-12 Exploring Mass, Equal Shares, and Equal Groups – Exploration Lesson 3.MD.A.2. Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). ⁴ Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem. 3.NF.A.1. Understand a fraction $\frac{1}{b}$ as the quantity formed by 1 part when a whole is partitioned into b equal parts; understand a fraction $\frac{a}{b}$ as the quantity formed by a parts of size $\frac{1}{b}$. 3.G.A.2. Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole. For example, partition a shape into 4 parts with equal area, and describe the area of each part as $\frac{1}{4}$ of the area of the shape.	

Grade 3 Unit One Math Tools, Time, and Multiplication		
Connections/Notes		Additional Resources
<p>3.OA.A.1. Interpret products of whole numbers, e.g., interpret 5×7 as the total number of objects in 5 groups of 7 objects each. <i>For example, describe a context in which a total number of objects can be expressed as 5×7.</i></p> <p>Lesson 1-12 Students compare masses and divide wholes and sets into equal shares.</p> <p>Lesson 1-12 is the exploration lesson for Unit One. Explorations provide an opportunity for students to work in small groups on several informal open-ended activities. Students are encouraged to explain their thinking and to follow the rules for cooperative learning.</p> <p>Exploration A: Comparing Masses - Students are introduced to the tools and units used to estimate and measure mass of objects. They use a balance and standard masses to measure the masses (grams and kilograms) of objects.</p> <p>Exploration B: Creating Equal Shares - Students named fractional parts in <i>First</i> and <i>Second Grade</i> using language such as 1-half and 1 out of 2 equal shares. Introducing standard notation for fractions ($\frac{1}{2}$ and $\frac{1}{4}$, for example) too early can promote misconceptions, such as thinking that $\frac{1}{4}$ is larger than $\frac{1}{2}$ because 4 is larger than 2. Although children may be familiar with standard fractional notation from everyday life, it will be introduced with length measurement in Unit 4 and covered in depth with fractions in Unit 5.</p> <p>Exploration C: Creating Equal Groups - Given a shape, students partition it into equal parts, recognizing that these parts all have the same area. They identify the fractional name of each part and are able to partition a shape into parts with equal areas.</p>		<p>Activity Cards 15, 16, & 17</p> 
<p>Lesson 1-13 Measuring Mass</p> <p>3.MD.A.2. Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l).⁴ Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem.</p> <p>Lesson 1-13 Students measure the mass of objects using a pan balance and standard masses. They determine benchmark items (large paper clip – 1 gram and a one-liter bottle of water – 1 kilogram) that will assist them with estimating the masses of objects.</p>		<p>3.MD.A.2. Lessons</p> <p>Build and Decompose a Kilogram Develop Estimation Strategies for Metric Weight</p> <p>Activities and Tasks</p> <p>Weigh It Twice Measuring Mass and Volume</p>



Grade 3 Unit One Math Tools, Time, and Multiplication	
Connections/Notes	Additional Resources
<p>3.MD.A.2. MCAP:</p> <p>Evidence Statement: The language of the standard should guide the creation of assessment tasks, including the ideas in the given examples.</p> <p>Clarifications:</p> <ul style="list-style-type: none"> • <i>Tasks use drawings such as a beaker with measurement scale or balance scales, etc. to provide information for solving the problem.</i> • <i>Tasks do not require computations beyond the grade 3 expectations.</i> 	<p>Videos Find the Mass of an Object Using a Balance Scale</p> <p>Online Measuring Scales</p> <p>Templates Platform Scales</p>
Lesson 1-14 Unit 1 Assessment	<p>Math GR 3 Unit 1 Summative Assessment in eDoctrina</p>

Grade 3 Unit 2 Number Stories and Arrays	
Connections/Notes	Additional Resources
Lesson 2-1 Extended Math Facts 3.NBT.A.2. Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.	
<p>Lesson 2-1 Students use basic addition and subtraction facts to solve problems with larger numbers. In this lesson students will notice patterns and relationships to help them determine a sum or difference.</p> <p>How does knowing $8 + 7 = 15$, help you solve the fact extension $28 + 7$ or $48 + 7$?</p> <p>How does knowing $12 - 5 = 7$, help you solve the fact extension $120 - 50$ or $1,200 - 500$?</p> <p>How does knowing $3 + 7 = 10$, help you solve the fact extension $33 + \underline{\quad} = 40$ or $83 + \underline{\quad} = 90$?</p> <p>Common Misconception: <i>If children struggle to jump from the Enter to the Change to number using multiples of 10 or 100, encourage them to repeatedly add or subtract 10 or 100. For example, to change from 800 to 740, a child could subtract 10 six times and record -10, -10, -10, -10, -10, -10 or -60, or -6 (10s) in the “How?” column.</i></p> <p>3.NBT.A.2 MCAP Evidence Statement: The language of the standard should guide the creation of assessment tasks, including the ideas in the given examples.</p> <p>Fluency is defined as the means to find the answer to multi-digit numbers using methods that include accuracy, efficiency, and flexibility of thinking. The standard focuses on the strategies commonly used to find the answers when adding or subtracting within 1000.</p> <p>Clarifications:</p> <ul style="list-style-type: none"> • Tasks should be written to equally focus on both addition and subtraction within 1000. • Tasks have little to no context. • Not all of the tasks should require just an answer. There should be tasks that reflect commonly used strategies as named in the standard. • Tasks include numbers with sums not greater than 1000. • This standard should only be used for content problems. This standard is not appropriate as the content focus for reasoning and modeling tasks since a calculator is available for computation on modeling and reasoning tasks. 	
Lesson 2-2 Number Stories and Lesson 2-3 More Number Stories 3.NBT.A.2. Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction. 3.OA.D.8. Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.	

Grade 3 Unit 2 Number Stories and Arrays

Connections/Notes

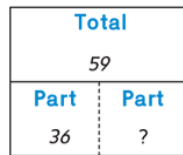
Students in grades one and two were introduced to situation diagrams that help them organize their information in simple one-step problems and help them write number models (expressions or equations) that represent the problems. These diagrams are reviewed in these two lessons.

Students should be allowed to use problem solving methods that best fit their needs. Not all will need situation diagrams to organize their problem solving. More than one diagram may fit a given situation, and most problems can be solved in more than one way.

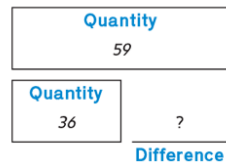
In **Lesson 2-2**, students use diagrams or pictures to help solve number stories. The **Guide to Solving Number Stories** will be modeled:

1. **Make sense of the problem.**
2. **Make a plan.**

The problem can be modeled using, counters, drawings, equations, or diagrams.



Parts-and-Total



Comparison



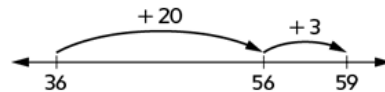
Change Diagram

$\underline{\hspace{1cm}} = 59 - 36$ $36 + \underline{\hspace{1cm}} = 59$
--

**Number Models
(Equations)**

3. **Solve the problem.**

4. **Check.**



Lesson 2-3 Students use situation diagrams and other representations to help solve number stories.

Lesson 2-4 Multi-Step Number Stories, Part 1 and Lesson 2-5 Multi-Step Number Stories Part 2

3.OA.A.3. Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.

Additional Resources

3.NBT.A.2.

Teaching Student Centered Mathematics

Drawings and Diagrams for Story Problems pgs. 304-306

Online

[Thinking Blocks for Bar Modeling](#)

Go to TangMath for practice with word problems

Grade 3 Unit 2 Number Stories and Arrays	
Connections/Notes	Additional Resources
<p>3.OA.C.7. Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that $8 \times 5 = 40$, one knows $40 \div 5 = 8$) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.</p> <p>3.OA.D.8. Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.</p> <p>3.NBT.A.2. Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.</p>	
<p>Lesson 2-4 Students will make sense of and solve number stories using two operations in these two lessons.</p> <p>These two lessons are grouped because students will solve number stories and model them with number sentences. The stories may be solved through direct modeling, counting, or by one or several calculations, and do not have to be solved in two steps. Students will revisit two-step number stories throughout third grade. Through continued practice, students will make better sense of the problems they face and become more efficient at solving them. The focus of these lessons is on solving two-step word problems involving addition and subtraction.</p> <p>Students will solve number stories and write number models to keep track of their thinking. A number model is a number sentence, expression, or equation that models number stories or other real-world experiences.</p> <p>Common Misconception: <i>Watch for children who mistakenly add all three quantities in multistep number stories or who add the first two numbers but do not know what to do with the third. Help them make sense of each part and choose the appropriate operation. Ask: What happened first? Next?</i></p> <p>3.OA.D.8. MCAP Evidence Statement: The language of the standard should guide the creation of assessment tasks, including the ideas in the given examples. Clarifications:</p> <ul style="list-style-type: none"> • <i>Tasks must be two-step problems using any of the four operations.</i> • <i>Tasks will allow students to represent their solution path using equations with a letter for the unknown quantity.</i> • <i>Tasks include two out of the four operations and any of the problem situation types with unknowns in various positions. Reference the table Multiplication and Division Situations, found on page 18 in this document.</i> 	<p>3.OA.D.8. Teaching Student Centered Mathematics Two-Step Problems, pg. 70 Drawings and Diagrams for Story Problems, pgs. 304-306</p> <p>Lessons Solve Two-step Word Problems within 100 (add/subtract). Estimate Sums</p> <p>Activities and Tasks Two Step Word Problems</p>


Grade 3 Unit 2 Number Stories and Arrays

Connections/Notes	Additional Resources
<p>Lesson 2-6 Equal Groups</p> <p>3.OA.A.1. Interpret products of whole numbers, e.g., interpret 5×7 as the total number of objects in 5 groups of 7 objects each. <i>For example, describe a context in which a total number of objects can be expressed as 5×7.</i></p> <p>3.OA.A.3. Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.</p> <p>3.OA.B.5. Apply properties of operations as strategies to multiply and divide.²</p> <p>3.OA.C.7. Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that $8 \times 5 = 40$, one knows $40 \div 5 = 8$) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.</p> <p>3.OA.D.9. Identify arithmetic patterns (including patterns in the addition table or multiplication table) and explain them using properties of operations.</p>	
<p>Lesson 2-6 Students solve problems involving multiples of equal groups and make sense of multiplying by 0 and 1.</p> <p>In this lesson, students share strategies and solutions and reflect on the efficiency of their strategies, as they continue solving equal group problems. In equal-groups situation, there are several groups of objects with the same number of objects in each group. When the number of groups and objects in each group are known, you can solve the problem by multiplying. Equal groups situations in which the total number of objects are known are called equal-grouping (unknown number of groups) and equal-sharing (unknown number of objects in each group) problems. You can solve an equal-grouping or equal-sharing problem by dividing or thinking of it as multiplication with an unknown factor. (3.OA.2, 3.OA.4.)</p> <p>Students will generalize how to multiply by 0 or 1 and add their ideas to the Fact Strategy Wall. Record ideas that demonstrate understanding of properties, such as “To multiply by 0, I think of 0 groups of something, which would be 0,” and “To multiply by 1, I think of 1 group of something, which would give me that number of things.”</p> <p><u>Common Misconception</u> <i>Children often confuse the results multiplying by 0 or 1 with adding 0 or 1. For example, they may think that $0 \times 3 = 3$ because 0 is the additive identity. Emphasize the equal groups meaning of multiplication by providing sentence frames such as: $0 \times \underline{\hspace{2cm}}$ means 0 groups of $\underline{\hspace{2cm}}$; $1 \times \underline{\hspace{2cm}}$ means 1 group of $\underline{\hspace{2cm}}$.</i></p> <p>3.OA.A.1 MCAP Evidence Statement: The language of the standard should guide the creation of assessment tasks, including the ideas in the given examples.</p>	<p>3.OA.A.1. <u>Lessons</u> Accounting for Butterflies</p> <p>3.OA.C.7. (0s, 1s) <u>Teaching Student Centered Mathematics</u> Strategies for Multiplication Facts, pg. 89</p> <p><u>Lessons</u> Reason About Multiplication 0s,1s</p> <p><u>Activities and Tasks</u> Multiplication No. Wheel (0, 1) Multiplication Challenge (0, 1)</p> <p><u>Templates</u> Blank Multiplication Chart</p>

Grade 3 Unit 2 Number Stories and Arrays

Connections/Notes	Additional Resources
<p>Clarifications:</p> <ul style="list-style-type: none"> • <i>The intent of this standard is to interpret multiplication expressions and equations using the definition of multiplication as stated in the standard. It is not to assess calculating products.</i> • <i>Tasks involve interpreting products rather than calculating products in terms of equal groups, arrays, area, and/or measurement quantities. All four representations listed should be used in tasks, not just equal groups.</i> • <i>Task context should be aligned to the equal parts problem types shown in the Multiplication and Division Situations table found on page 18 of this document.</i> <p>3.OA.A.3 MCAP Evidence Statement: For assessment, this standard has been divided into two sections one for each operation. 3.OA.A.3-1 only focuses on multiplication within 100 with both factors being less than or equal to 10 The intent of the standard is for students to solve word problem types listed in the table of Multiplication and Division Situations found in on pages 17-18 of this document. Clarifications for both multiplication and division:</p> <ul style="list-style-type: none"> • <i>Tasks should not include a symbol for the unknown. This concept will be assessed in 3.OA.A.4 using a symbol for the unknown.</i> • <i>Tasks should require students to represent the context of a multiplication or division problem with a correct equation. (Answers must be given.)</i> • <i>Context may include word and/or an assortment of visual models using equal groups, arrays, or area models.</i> • <i>Must have context for a single-step word problem.</i> • <i>If students are asked to identify the equation that matches the problem situation, a variety of equation representations should be used, such as $5 \times 8 = 40$ or $40 = 5 \times 8$, etc.)</i> • <i>For more information about word problem types, see the table, Multiplication and Division Situations, found in on pages 17-18 of this document.</i> <p>3.OA.C.7 MCAP Evidence Statement: For assessment, this standard is divided by operation. 3.OA.C.7-1 tasks will only address multiplication within 100 for fluency. The word fluency does not mean instant recall (automaticity). Fluency means the recall of facts involves accuracy, efficiency, and flexibility. The standard focuses on the strategies commonly used to find the products.</p>	

Grade 3 Unit 2 Number Stories and Arrays

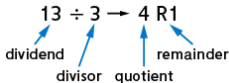
Connections/Notes	Additional Resources
<p>Clarifications:</p> <ul style="list-style-type: none"> • Tasks assess the entire standard except for the last sentence, “By end of grade 3, know from memory all products of two one-digit numbers. • Tasks do not have a context. • Tasks are not timed. • Tasks may include how the mental math strategies, properties of operations, or relationships between and among operations are used to multiply whole numbers with factors with products within 100. • This standard should only be used for content problems. This standard is not appropriate as the content focus for reasoning and modeling tasks since a calculator is available for computation on modeling and reasoning tasks. 	
<p>Lesson 2-7 Multiplication Arrays</p> <p>3.OA.A.1. Students recognize multiplication as a means to determine the total number of objects when there are a specific number of groups with the same number of objects in each group. Multiplication requires students to think in terms of groups of things rather than individual things. Students learn that the multiplication symbol “x” means groups of - such as 5×7 refer to 5 groups of 7.</p> <p>3.OA.A.2. Interpret whole-number quotients of whole numbers, e.g., interpret $56 \div 8$ as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each. <i>For example, describe a context in which a number of shares or a number of groups can be expressed as $56 \div 8$.</i></p> <p>3.OA.A.3. Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.</p> <p>3.OA.A.4. Determine the unknown whole number in a multiplication or division equation relating three whole numbers. <i>For example, determine the unknown number that makes the equation true in each of the equations $8 \times ? = 48$, $5 = _ \div 3$, $6 \times 6 = ?$</i></p> <p>3.OA.C.7. Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that $8 \times 5 = 40$, one knows $40 \div 5 = 8$) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.</p>	
<p>Lesson 2-7 Students solve array problems and Play <i>Array Bingo</i>. Array situations are equal-groups situations in which either factor can be thought of as the “number of objects in each group.” If equal groups are arranged in rows and columns, they form a rectangular array. As with equal-groups situations, array problems can be solved using either multiplication or division.</p> <div style="display: flex; align-items: center; margin-top: 20px;"> <div style="flex: 1;"> <p>3 boxes of crayons, 5 crayons in each box: how many crayons?</p> </div> <div style="flex: 1; text-align: center;">  </div> </div>	<p>3.OA.A.3</p> <p><u>Activities and Tasks</u> Number Story Arrays Factor Pair Array Cards</p> <p><u>Templates and Visuals</u> Array Cards Choose Three Ways</p>

Grade 3 Unit 2 Number Stories and Arrays

Connections/Notes	Additional Resources
<p>Lesson 2-8 Picturing Division Open Response and Re-engagement 2 Days</p> <p>3.OA.A.2. Interpret whole-number quotients of whole numbers, e.g., interpret $56 \div 8$ as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each. <i>For example, describe a context in which a number of shares or a number of groups can be expressed as $56 \div 8$.</i></p> <p>3.OA.A.3. Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.</p> <p>3.OA.A.4. Determine the unknown whole number in a multiplication or division equation relating three whole numbers. <i>For example, determine the unknown number that makes the equation true in each of the equations $8 \times ? = 48$, $5 = _ \div 3$, $6 \times 6 = ?$</i></p> <p>Day 1: Children create mathematical representations for solving division problems. Day 2: Children discuss representations and solutions and then revise their work.</p> <p>The focus practice for this lesson is creating mathematical representations using manipulatives, drawings, words, or number models.</p> <p><i>*This lesson includes a story problem with a remainder. Although the grade 3 standard does not address remainders, students will often encounter story problems involving remainders. Note how students interpret the remainder in Problem #2.</i></p> <p>Common Misconception Problem #1 <i>Some children may think of 4 as the number of children in each group, rather than the number of tables (groups). Have them review the context of the problem and ask whether their strategies make sense. These children may benefit from using counters to represent children and stick-on notes to represent tables. With these manipulatives, children can create a representation that reflects the number of children at each table to help them determine the total number of tables needed.</i></p> <p>On Day 2, students review the division problems, discuss their classmates' representations and solutions, and discuss what a good response might include.</p> <p>3.OA.A.2 MCAP Evidence Statement: The language of the standard should guide the creation of assessment tasks, including the ideas in the given examples. Clarifications:</p> <ul style="list-style-type: none"> <i>The intent of this standard is to interpret division expressions and equations using the definition of division as stated in the standard. It is not to assess calculating quotients.</i> 	<p>3.OA.A.1 Lessons Hopping Into Multiplication</p>

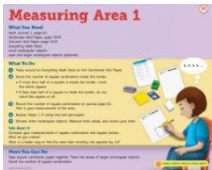
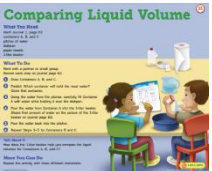
Grade 3 Unit 2 Number Stories and Arrays	
Connections/Notes	Additional Resources
<ul style="list-style-type: none"> Tasks involve interpreting quotients rather than calculating quotients in terms of equal groups, arrays, area, and/or measurement quantities. - See the table for Multiplication and Division Situations found on page 18 of this document. Tasks involve interpreting quotients rather than calculating quotients in terms of equal groups, arrays, area, and/or measurement quantities. All representations should be used in tasks, not just equal groups. Half the tasks require interpreting quotients as a number of objects in each share and half require interpreting quotients as a number of equal shares. (Both Partitive and Measurement division types) <p>3.OA.A.4 MCAP Evidence Statement: The intent of the standard is for students to determine the unknown whole number in multiplication and division equations. During instruction of 3. OA.A.3, students represent unknown numbers using a symbol (an empty small square or question mark) This standard is a transition standard to 3.OA.A.8 where students are introduced to equation notation with the unknown represented with a letter. Clarifications:</p> <ul style="list-style-type: none"> Tasks do not have a context. Tasks require students to write the equation and represent the unknown with a letter. Tasks should include the concept that of the relationship between multiplication and division. Reference the table, Addition and Subtraction Situations found on page 17 of this document. 	
<p>Lesson 2-9 Modeling Division and Lesson 2-10 Playing Division Arrays</p> <p>3.OA.A.2. Interpret whole-number quotients of whole numbers, e.g., interpret $56 \div 8$ as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each. <i>For example, describe a context in which a number of shares or a number of groups can be expressed as $56 \div 8$.</i></p> <p>3.OA.A.3. Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.</p> <p>3.OA.C.7. Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that $8 \times 5 = 40$, one knows $40 \div 5 = 8$) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.</p> <p>3.NF.A.1. Understand a fraction $\frac{1}{b}$ as the quantity formed by 1 part when a whole is partitioned into b equal parts; understand a fraction $\frac{a}{b}$ as the quantity formed by a parts of size $\frac{1}{b}$.</p> <p>3.G.A.2. Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole.</p>	
<p>Lesson 2-9 Students solve division number stories and learn about remainders.</p>	<p>3.OA.A.2 Markers in Boxes</p>

Grade 3 Unit 2 Number Stories and Arrays

Connections/Notes	Additional Resources
<p>The equal sharing stories in this lesson will introduce students to problems with remainders. They reason about different ways to handle the “leftovers.” Some leftovers will be divided into halves or fourths to share. Number stories that provide a real-world context for equal sharing of collections or objects help children develop a fundamental understanding of division.</p> <p>Research suggests that equal-sharing problems resulting in fractional shares, such as the one in the Math Message, are an important way to introduce children to fractions. Children shared fractional parts of pancakes in Lesson 1-12. When given contexts that involve sharing familiar objects, children will use intuitive notions about sharing to divide multiple wholes equally.</p> <p>Model writing the division number model with a remainder: $6 \div 4 \rightarrow 1$ remainder 2, or 1 R 2. Explain that an arrow may be used instead of the equal sign when there is a remainder. This arrow is read as leads to, gives, results in, or a similar expression.</p> <div style="text-align: center;">  <p style="margin: 0;">dividend divisor quotient remainder</p> </div> <p>Vocabulary terms:</p> <p>Common Misconception: <i>Some children may struggle to make sense of the remainder and simply cross out the extra items to be shared. It may help to provide these children with actual counters and a blank sheet of paper, on which they can label a “remainder” pile, so they have a specific place to put those extra items.</i></p> <p>Lesson 2-10 In this lesson, students will learn to model division with and without remainders during the <i>Division Arrays</i> game. They identify even and odd number patterns in arithmetic and build their understanding of factors, remainders, and divisibility.</p> <p>3.OA.A.2. MCAP Evidence Statement: The language of the standard should guide the creation of assessment tasks, including the ideas in the given examples. Clarifications:</p> <ul style="list-style-type: none"> • <i>The intent of this standard is to interpret division expressions and equations using the definition of division as stated in the standard. It is not to assess calculating quotients.</i> • <i>Tasks involve interpreting quotients rather than calculating quotients in terms of equal groups, arrays, area, and/or measurement quantities. - See the table for Multiplication and Division Situations found on page 18 of this document.</i> 	<p>3.OA.A.3 Lessons Understand the Meaning of the Unknown Group Interpret the Unknown</p> <p>Online Thinking Blocks for Bar Modeling</p>

Grade 3 Unit 2 Number Stories and Arrays

Connections/Notes	Additional Resources
<ul style="list-style-type: none"> Tasks involve interpreting quotients rather than calculating quotients in terms of equal groups, arrays, area, and/or measurement quantities. All representations should be used in tasks, not just equal groups. Half the tasks require interpreting quotients as a number of objects in each share and half require interpreting quotients as a number of equal shares. (Both Partitive and Measurement division types) 	
<p>Lesson 2-11 Frames and Arrows</p> <p>3.OA.C.7. Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that $8 \times 5 = 40$, one knows $40 \div 5 = 8$) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.</p> <p>3.NBT.A.2. Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.</p>	
<p>Lesson 2-11 Students review Frames-and-Arrows diagrams and solve problems using the four operations.</p> <p><i>Everyday Mathematics</i> uses Frames-and-Arrows diagrams across grades to represent number sequences. Each frame contains a number forming the sequence, and each arrow represents a rule (called an arrow rule) that may involve one or more arithmetic operations. The rule determines which number goes in the next frame. Students apply rules to determine missing frames and interpret number patterns to figure out missing rules. Frames-and-Arrow diagrams help develop students' abilities to determine patterns and rules and reinforce connections between operations.</p> <div data-bbox="646 987 1092 1079" style="text-align: center;"> </div>	
<p>Lesson 2-12 Exploring Fractions Circles, Liquid Volume, and Area – Exploration Lesson</p> <p>3.NF.A.1. Understand a fraction $1/b$ as the quantity formed by 1 part when a whole is partitioned into b equal parts; understand a fraction a/b as the quantity formed by a parts of size $1/b$.</p> <p>3.MD.A.2. Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l).¹ Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem.</p> <p>3.MD.C.5. Recognize area as an attribute of plane figures and understand concepts of area measurement.</p> <ol style="list-style-type: none"> A square with side length 1 unit, called “a unit square,” is said to have “one square unit” of area, and can be used to measure area. A plane figure which can be covered without gaps or overlaps by n unit squares is said to have an area of n square units. <p>3.MD.C.6. Measure areas by counting unit squares (square cm, square m., square in., square ft., and improvised units).</p>	

Grade 3 Unit 2 Number Stories and Arrays	
Connections/Notes	Additional Resources
<p>Students explore fraction circles, area measures, and liquid volume in liters.</p> <p>Lesson 2-12 is the exploration lesson for Unit 2.</p> <p>Exploration A: Exploring Fraction Circles (In this activity, students continue to use “half, third, and fourth” when describing parts of a whole.)</p> <p>Exploration B: Measuring Area Have students follow directions on Activity Card 32 to measure and record the areas of different rectangular objects. Explain that the amount of surface inside the borders, or boundary, of each object is called the area.</p> <p>Exploration C: Comparing Liquid Volume Students estimate volume relative to 1 liter in this Exploration. Explain that liquid volume is the amount of liquid in a container and that a liter is a unit of volume. Briefly introduce the 1-liter beaker, pointing out the marks you made that show 1-half liter (500 mL) and 1 liter (1,000 mL). Explain that the markings on the beaker's scale show milliliters, a smaller unit of liquid volume.</p>	<p>Activity Cards 23 & 33</p>  
Lesson 2-13 Unit 2 Assessment	Math GR 3 Unit 2 Summative Assessment in eDoctrina

Grade 3 Unit Three Operations

Connections/Notes

Additional Resources

Lesson 3-1 “What’s My Rule?”

3.OA.A.4. Determine the unknown whole number in a multiplication or division equation relating three whole numbers. *For example, determine the unknown number that makes the equation true in each of the equations $8 \times ? = 48$, $5 = _ \div 3$, $6 \times 6 = ?$*

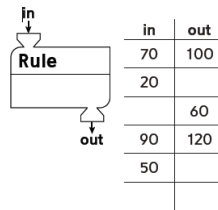
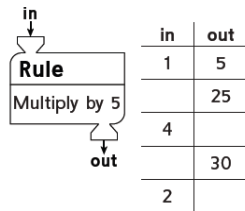
3.OA.C.7. Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that $8 \times 5 = 40$, one knows $40 \div 5 = 8$) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.

3.NBT.A.2. Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.

Lesson 3-1 Students find missing numbers and rules in “What’s My Rule?” tables.

Remind students that they use a “What’s My Rule?” table to keep track of how a **function machine** changes numbers:

- A number (the **input**) is dropped into the machine.
- The machine changes the number according to a **rule**.
- A new number (the **output**) comes out the other end.



3.OA.A.4.

This standard is strongly connected to 3.OA.A.3 when students solve problems and determine unknowns in equations. Students apply their understanding of the meaning of the equal sign as “the same as” to interpret an equation with an unknown.

When given $4 \times ? = 40$, they might think:

- 4 groups of some number is the same as 40
- 4 times some number is the same as 40
- I know that 4 groups of 10 is 40 so the unknown number is 10
- The missing factor is 10 because 4 times 10 equals 40.

3.OA.A.4.

Activities and Tasks

What Is the Missing Number?
Division As Unknown Factor Problems
Missing Numbers

Grade 3 Unit Three Operations	
Connections/Notes	Additional Resources
<p>3.OA.A.4 MCAP Evidence Statement: The intent of the standard is for students to determine the unknown whole number in multiplication and division equations. During instruction of 3.OA.A.3, students represent unknown numbers using a symbol (an empty small square or question mark) This standard is a transition standard to 3.OA.A.8 where students are introduced to equation notation with the unknown represented with a letter. Clarifications:</p> <ul style="list-style-type: none"> • Tasks do not have a context. • Tasks require students to write the equation and represent the unknown with a letter. • Tasks should include the concept that of the relationship between multiplication and division. 	
<p>Lesson 3-2 Estimating Costs Open Response and Reengagement 2 Days 3.OA.D.8. Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding. 3.NBT.A.1. Use place value understanding to round whole numbers to the nearest 10 or 100. 3.NBT.A.2. Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.</p>	
<p>Day 1: Students make estimates for problems they solve using mental math. The focus mathematical practice for this lesson is GMP6.1. Children are asked to show the thinking they do in their heads to solve a two-step number story. To explain their thinking clearly and precisely, children need to show both the close-but-easier numbers and the mental computations they used. Students will make an estimate in their heads to check whether an answer is reasonable, and they will then show or explain their thinking clearly enough so others can solve the problem using the same strategy.</p> <p>Day 2: Students examine others' explanations using a rubric as a guide and then revise their work. Students' task was to decide whether Ann's answer was reasonable using an estimate, and to explain how they decided. Children reengage in the problem by analyzing and critiquing other children's work in pairs and in a whole-group discussion. Have children discuss with partners before sharing with the whole group. Guide this discussion based on the decisions you made in Getting Ready for Day 2. Include a discussion in which the class comes to a consensus that Ann's answer to her homework problem is not reasonable.</p>	
<p>Lesson 3-3 Partial-Sums Addition and Lesson 3-4 Column Addition 3.OA.D.8. Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding. 3.NBT.A.1. Use place value understanding to round whole numbers to the nearest 10 or 100. 3.NBT.A.2. Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.</p>	
<p>Lesson 3-3 Students use partial-sums addition to add 2- and 3-digit numbers. Lesson 3-4 Students are introduced to column addition.</p>	<p>3.NBT.A.2. Activities and Tasks</p>

Grade 3 Unit Three Operations

Connections/Notes

These two lessons focus on two different addition methods: partial-sums addition and column addition. Students use these methods to add 3-digit numbers.

Partial Sums Example:

$$\begin{array}{r} 145 \\ + 322 \\ \hline \end{array}$$

$100 + 300 \rightarrow 400$
 $40 + 20 \rightarrow 60$
 $5 + 2 \rightarrow 7$
 $400 + 60 + 7 = 467$
 $145 + 322 = 467$

Column Addition Example:

100s	10s	1s
2	4	8
+ 1	8	7
3	12	15
3	13	5
4	3	5

Trade 10 ones for 1 ten and add 1 ten to the 12 tens in the tens column.

Trade 10 tens for 1 hundred and add the 1 hundred to the 3 hundreds in the hundreds column.

$248 + 187 = 435$

Adjusting the Activity

Have children who struggle with place value represent each addend with base-10 blocks or base-10 shorthand. To add, they gather the flats together, then the longs, then the cubes, and count the total number of hundreds, tens, and ones.

$145 + 322 = ?$

$145 + 322 = 467$

3.NBT.A.2.

Problems should include both vertical and horizontal forms, including opportunities for students to apply the commutative and associative properties. Adding and subtracting fluently refers to knowledge of procedures, knowledge of when and how to use them appropriately, and skill in performing them flexibly, accurately, and efficiently. Students explain their thinking and show their work by using strategies and algorithms and verify that their answer is reasonable.

Common Misconception: Watch for children who do not trade and write incorrect sums that combine all the digits. For example, a child may say the sum in the problem below is 31,215 instead of 435.

100s	10s	1s
2	4	8
+ 1	8	7
3	12	15

Additional Resources

Three Digit Addition Split
Doubling to 1,000
Six Common Strategies for Addition

Templates

Part-Part Whole Mat

Grade 3 Unit Three Operations	
Connections/Notes	Additional Resources
<p>Encourage children to estimate to check whether their answers make sense. Provide base-10 blocks and a place-value mat. (Math Master, page TA14) to model the ones, tens, and hundreds and make appropriate trades.</p> <p>3.OA.D.8</p> <p>MCAP Evidence Statement: The language of the standard should guide the creation of assessment tasks, including the ideas in the given examples.</p> <p>Clarifications:</p> <ul style="list-style-type: none"> • <i>Tasks must be two-step problems using any of the four operations.</i> • <i>Tasks will allow students to represent their solution path using equations with a letter for the unknown quantity</i> • <i>Tasks include two out of the four operations and any of the problem situation types with unknowns in various positions. Reference the table Multiplication and Division Situations, found on page 18 of this document.</i> <p>3.NBT.A.2</p> <p>MCAP Evidence Statement: The language of the standard should guide the creation of assessment tasks, including the ideas in the given examples.</p> <p>Fluency is defined as the means to find the answer to multi-digit numbers using methods that include accuracy, efficiency, and flexibility of thinking. The standard focuses on the strategies commonly used to find the answers when adding or subtracting within 1000.</p> <p>Clarifications:</p> <ul style="list-style-type: none"> • <i>Tasks should be written to equally focus on both addition and subtraction within 1000.</i> • <i>Tasks have little to no context.</i> • <i>Not all of the tasks should require just an answer. There should be tasks that reflect commonly used strategies as named in the standard.</i> • <i>Tasks include numbers with sums not greater than 1000.</i> • <i>This standard should only be used for content problems. This standard is not appropriate as the content focus for reasoning and modeling tasks since a calculator is available for computation on modeling and reasoning tasks.</i> 	
<p>Lesson 3-5 Counting-Up Subtraction and Lesson 3-6 Expand-and-Trade Subtraction</p> <p>3.OA.D.8. Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.</p>	

Grade 3 Unit Three Operations

Connections/Notes

Additional Resources

3.NBT.A.1. Use place value understanding to round whole numbers to the nearest 10 or 100.

3.NBT.A.2. Fluently add and **subtract** within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.

Lesson 3-5 Students review counting-up subtraction.

Lesson 3-6 Students use expand and trade to solve subtraction problems.

3.NBT.A.1

MCAP Evidence Statement: The language of the standard should guide the creation of assessment tasks, including the ideas in the given examples.

Clarifications:

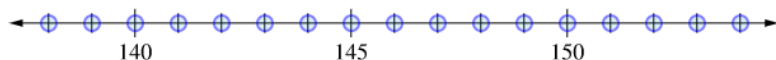
- *Tasks have little to no context.*
- *Tasks should allow students to apply strategies of rounding numbers to the nearest 10 and 100.*
- *Tasks should provide several examples of rounding two-and three-digit numbers and ask students to identify and describe place value patterns that result.*
- *Tasks should involve rounding numbers to the nearest 10 or 100 using a number line.*

MCAP Sample Question:

Round **148** to the nearest ten.

Plot your rounded answer on the following number line.

Select a place on the number line to plot the point.

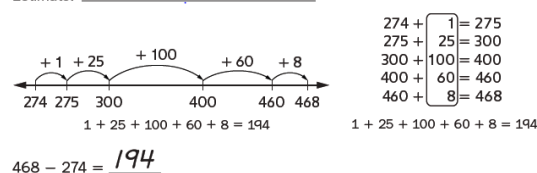


3.NBT.A.2.

Counting-Up Strategy

Example: $468 - 274 = ?$

Estimate: $500 - 300 = 200$



3.NBT.A.2.

Activities

Five Common Strategies for Subtraction

Templates

Part-Part Whole Mat

Grade 3 Unit Three Operations

Connections/Notes

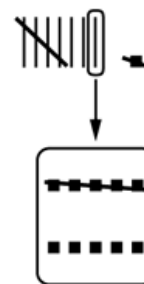
Additional Resources

Expand-and-Trade Strategy

Example: $247 - 186 = ?$

Estimate: $250 - 200 = 50$

$$\begin{array}{r}
 247 \rightarrow 200 + 40 + 7 \\
 - 186 \rightarrow 100 + 80 + 6 \\
 \hline
 60 + 1 = 61
 \end{array}$$



Have students solve additional 2- and 3-digit subtraction problems using base ten blocks.

$$71 - 46 = \underline{\quad}$$

Professional Development

This lesson reviews expand-and-trade subtraction, which was introduced late in *Second Grade Everyday Mathematics*. Expand-and-trade subtraction relies on place-value understanding. Exposing children to multiple strategies allows them to think flexibly and choose the most efficient strategy for them. By the end of third grade, children are expected to fluently subtract within 1,000 using strategies based on place-value, properties of operations, and/or the relationship between addition and subtraction.

Problems should include both vertical and horizontal forms, including opportunities for students to apply the commutative and associative properties. Adding and subtracting fluently refers to knowledge of procedures, knowledge of when and how to use them appropriately, and skill in performing them flexibly, accurately, and efficiently. Students explain their thinking and show their work by using strategies and algorithms and verify that their answer is reasonable.

Common Misconception: Watch for children who interpret the addition symbols in the expanded forms of each number as signals to add rather than subtract the subtrahend and minuend. Have them circle the subtraction symbol in the problem as a reminder. Point out that the expanded forms help to illustrate the place value before making trades and subtracting – they do not change the directions for the problem.

Grade 3 Unit Three Operations	
Connections/Notes	Additional Resources
<p>3.NBT.A.2. MCAP Evidence Statement: The language of the standard should guide the creation of assessment tasks, including the ideas in the given examples.</p> <p>Fluency is defined as the means to find the answer to multi-digit numbers using methods that include accuracy, efficiency, and flexibility of thinking. The standard focuses on the strategies commonly used to find the answers when adding or subtracting within 1000.</p> <p>Clarifications:</p> <ul style="list-style-type: none"> • Tasks should be written to equally focus on both addition and subtraction within 1000. • Tasks have little to no context. • Not all of the tasks should require just an answer. There should be tasks that reflect commonly used strategies as named in the standard. • Tasks include numbers with sums not greater than 1000. • This standard should only be used for content problems. This standard is not appropriate as the content focus for reasoning and modeling tasks since a calculator is available for computation on modeling and reasoning tasks. 	
<p>Lesson 3-7 Exploring Bar Graphs, Area, and Partitioning Rectangles - Exploration Lesson</p> <p>3.MD.B.3. Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step “how many more” and “how many less” problems using information presented in scaled bar graphs. <i>For example, draw a bar graph in which each square in the bar graph might represent 5 pets.</i></p> <p>3.MD.C.5. Recognize area as an attribute of plane figures and understand concepts of area measurement.</p> <p>a) A square with side length 1 unit, called “a unit square,” is said to have “one square unit” of area, and can be used to measure area.</p> <p>b) A plane figure which can be covered without gaps or overlaps by n unit squares is said to have an area of n square units</p> <p>3.MD.C.6. Measure areas by counting unit squares (square cm, square m, square in, square ft, and improvised units).</p> <p>3.MD.C.7. Relate area to the operations of multiplication and addition.</p> <p>a) Find the area of a rectangle with whole-number side lengths by tiling it, and show that the area is the same as would be found by multiplying the side lengths.</p> <p>3.G.A.2. Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole. <i>For example, partition a shape into 4 parts with equal area, and describe the area of each part as $\frac{1}{4}$ of the area of the shape.</i></p>	
<p>Lesson 3-7 is the exploration lesson for Unit 3.</p> <p>Students explore different ways to measure area, partition rectangles, and represent data on a scaled bar graph.</p>	<p>3.MD.B.3. (Bar Graph)</p> <p>Activities and Tasks Reindeer Graphing</p>

Grade 3 Unit Three Operations

Connections/Notes

Exploration A: Creating a Scaled Bar Graph

Students will create a scaled bar graph based on sorting pattern blocks in an Exploration activity. Plan to spend more of your time working with children on Exploration A.

Exploration B: Measuring Area

Remind students that the amount of surface inside the boundaries of a 2-dimensional shape is called the **area**. The number of squares that cover the surface is a measurement of the area in **square units**. Explain that in this exploration, they will use 1-foot squares to **tile**, or completely cover, surfaces.

Exploration C: Partitioning Rectangles

Children partitioned rectangles in Second Grade. Remind them that to **partition** something is to divide it into smaller parts. Explain that we can find the area of a shape by dividing, or partitioning, it into equal parts.

Common Misconception: Watch for children who leave gaps or overlaps between squares. Help them line up their squares end to end (provide masking tape for marking the endpoints of squares and discuss why gaps and overlaps lead to errors in measurement).

Lesson 3-8 Scaled Picture Graphs

3.MD.B.3. Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step “how many more” and “how many less” problems using information presented in scaled bar graphs. *For example, draw a bar graph in which each square in the bar graph might represent 5 pets.*

3.NBT.A.2. Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.

Students create scaled picture graphs.

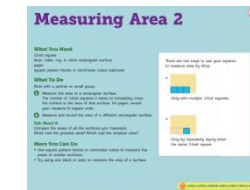
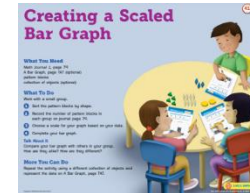
Students will be familiar with picture graphs from second grade but scaled picture graphs are new to third graders.

Example:



Additional Resources

Activity Cards 41 & 42



3.MD.B.3. (Picture Graph)

Activities and Tasks

Button Pictograph
Collecting and Representing Data
Matching Data with a Graph

Lessons

Generate and Organize Data
Solve One and Two-Step Problems Using Graphs

Grade 3 Unit Three Operations

Connections/Notes

Additional Resources

Adjusting the Activity

If children struggle to interpret symbols representing more than 1 on a scaled picture graph, have them write the value above each symbol on their graph. They can skip count or add the values to find the total. Watch for children who need additional support interpreting and calculating with a half symbol. Remind them to include that value in the total.

3.MD.B.3.

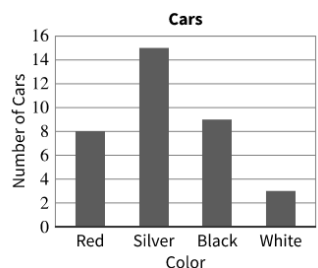
MCAP Evidence Statement: The language of the standard should guide the creation of assessment tasks, including the ideas in the given examples.

Clarifications:

- *Tasks will engage students in constructing, reading, and interpreting bar and picture graphs.*
- *Tasks will include problem types that are one-step and two-step “how many less” and “how many more” problems. The graph will provide information for the problem.*
- *Tasks that involve using a scaled bar graph, (e.g. On a bar graph each square that represents a data point is greater than 1)*
- *Tasks involve no more than 10 data points in 2-5 categories.*
- *Categorical data should not take the form of a category that should be represented numerically (e.g. do not use ages of students).*
- *Tasks do not require students to create the entire graph but might ask students to complete a graph or otherwise demonstrate knowledge of its creation.*
- *Tasks do not require computations beyond the grade 3 expectations.*

MCAP Sample Question:

The following bar graph shows the number of cars of each color that passed by a school during a certain period of time.



How many more silver cars passed by the school than black cars and white cars combined?

Select one answer.

- ☐ A. 3
- ☐ B. 4
- ☐ C. 6
- ☐ D. 7

Grade 3 Unit Three Operations

Connections/Notes

Additional Resources

Lesson 3-9 Exploring Multiplication Squares

3.OA.A.1. Interpret products of whole numbers, e.g., interpret 5×7 as the total number of objects in 5 groups of 7 objects each. *For example, describe a context in which a total number of objects can be expressed as 5×7 .*

3.OA.C.7. Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that $8 \times 5 = 40$, one knows $40 \div 5 = 8$) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.

Lesson 3-9 Students discover the multiplication squares and begin a fact strategy journal.

In this lesson, students will build and explore arrays with equal factors and classify these as **multiplication squares**. When both factors are the same you will have **square products**.

Strategies for finding products will be shared:

- skip counting $4 + 4 + 4 + 4$
- repeated addition $4, 8, 12, 16$
- count half the array and then double $(4 + 4) \times 2$

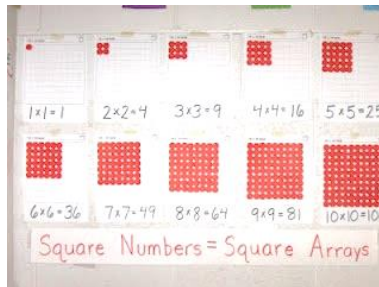
4 x 4 square

Sketch:

$\times \times \times \times$
 $\times \times \times \times$
 $\times \times \times \times$
 $\times \times \times \times$

The multiplication squares, like the doubles in addition, tend to be easier to remember. This lesson lays a foundation for a series of fact-strategy lessons later in this unit and in Unit 5, during which children use facts they know, such as multiplication squares, to derive unknown facts by adding or subtracting a group.

\times	1	2	3	4	5	6	7	8	9	10
1	1	2	3	4	5	6	7	8	9	10
2	2	4	6	8	10	12	14	16	18	20
3	3	6	9	12	15	18	21	24	27	30
4	4	8	12	16	20	24	28	32	36	40
5	5	10	15	20	25	30	35	40	45	50
6	6	12	18	24	30	36	42	48	54	60
7	7	14	21	28	35	42	49	56	63	70
8	8	16	24	32	40	48	56	64	72	80
9	9	18	27	36	45	54	63	72	81	90
10	10	20	30	40	50	60	70	80	90	100



Add **squares** to the **Fact Strategy Wall**.

3.OA.A.1

MCAP Evidence Statement: The language of the standard should guide the creation of assessment tasks, including the ideas in the given examples.

3.OA.C.7.

Activities

Blank Multiplication Chart

Grade 3 Unit Three Operations	
Connections/Notes	Additional Resources
<p>Clarifications:</p> <ul style="list-style-type: none"> The intent of this standard is to interpret multiplication expressions and equations using the definition of multiplication as stated in the standard. It is not to assess calculating products. Tasks involve interpreting products rather than calculating products in terms of equal groups, arrays, area, and/or measurement quantities. All four representations listed should be used in tasks, not just equal groups. Task context should be aligned to the equal parts problem types shown in the Multiplication and Division Situations table found on page 18 of this document. <p>3.OA.C.7</p> <p>MCAP Evidence Statement: For assessment, this standard is divided by operation. Tasks will only address multiplication within 100 for fluency. The word fluency does not mean instant recall (automaticity). Fluency means the recall of facts involves accuracy, efficiency, and flexibility. The standard focuses on the strategies commonly used to find the products.</p> <p>Clarifications:</p> <ul style="list-style-type: none"> Tasks assess the entire standard except for the last sentence, “By end of grade 3, know from memory all products of two one-digit numbers. Tasks do not have a context. Tasks are not timed. Tasks may include how the mental math strategies, properties of operations, or relationships between and among operations are used to multiply whole numbers with factors with products within 100. This standard should only be used for content problems. This standard is not appropriate as the content focus for reasoning and modeling tasks since a calculator is available for computation on modeling and reasoning tasks. 	
<p>Lesson 3-10 The Commutative Property of Multiplication</p> <p>3.OA.A.1. Interpret products of whole numbers, e.g., interpret 5×7 as the total number of objects in 5 groups of 7 objects each.</p> <p>3.OA.A.3. Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.</p> <p>3.OA.B.5. Apply properties of operations as strategies to multiply and divide.² Examples: If $6 \times 4 = 24$ is known, then $4 \times 6 = 24$ is also known. (Commutative property of multiplication.) $3 \times 5 \times 2$ can be found by $3 \times 5 = 15$, then $15 \times 2 = 30$, or by $5 \times 2 = 10$, then $3 \times 10 = 30$. (Associative property of multiplication.) Knowing that $8 \times 5 = 40$ and $8 \times 2 = 16$, one can find 8×7 as $8 \times (5 + 2) = (8 \times 5) + (8 \times 2) = 40 + 16 = 56$. (Distributive property.)</p>	

Grade 3 Unit Three Operations

Connections/Notes

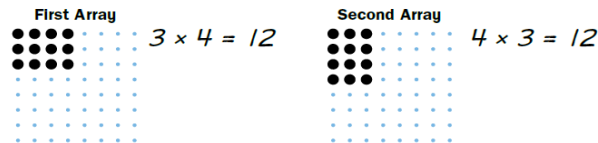
Additional Resources

3.OA.C.7. Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that $8 \times 5 = 40$, one knows $40 \div 5 = 8$) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.

3.OA.D.9. Identify arithmetic patterns (including patterns in the addition table or multiplication table) and explain them using properties of operations. *For example, observe that 4 times a number is always even, and explain why 4 times a number can be decomposed into two equal addends.*

Lesson 3-10 Students learn about the turn-around rule (Commutative Property of Multiplication).

This lesson provides students an opportunity to explore the **Commutative Property of Multiplication**. Arrays are used to connect to multiplication facts by representing “rows x columns.” By physically turning their arrays so that the rows and columns switch, students notice that the same array can be used to represent two different multiplication facts.



By investigating the multiplication facts table, students come to realize the power of the Commutative Property of Multiplication: for every fact that you already know, there is a fact related by the turn-around rule that they do not have to memorize.

Third graders are expected to apply this property, but they are not expected to know the formal name or definition.

Students will make sense of the **facts table** by modeling how to find products.

Multiplication/Division Facts Table

1	2	3	4	5	6	7	8	9	10
1	2	3	4	5	6	7	8	9	10
2	4	6	8	10	12	14	16	18	20
3	6	9	12	15	18	21	24	27	30
4	8	12	16	20	24	28	32	36	40
5	10	15	20	25	30	35	40	45	50
6	12	18	24	30	36	42	48	54	60
7	14	21	28	35	42	49	56	63	70
8	16	24	32	40	48	56	64	72	80
9	18	27	36	45	54	63	72	81	90
10	20	30	40	50	60	70	80	90	100

3.OA.B.5

MCAP Evidence Statement: The language of the standard should guide the creation of assessment tasks, including the ideas in the given examples.

Clarifications:

- Some tasks have context and other task do not have context.
- Products and related quotients are limited to the 10x10 multiplication table
- These tasks may not exceed the content limits of grade 3. For example, $2 \times 4 \times 5$, would be acceptable as students can use the associative property to rewrite the expression as $8 \times 5 = 40$,

3.OA.B.5.

Teaching Student Centered Mathematics

The Order Property in Multiplication, pg. 66

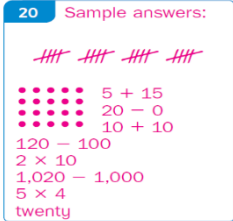
Lessons

Commutativity of Multiplication
Demonstrate Commutativity
Bar Diagrams to Model
Commutative Property

Grade 3 Unit Three Operations																																																																																		
Connections/Notes		Additional Resources																																																																																
<p><i>which falls within the content limits of grade 3. The problem $7 \times 4 \times 6$ would exceed the content limits of grade 3 because any use of the associative property would result in a 2-digit multiplier.</i></p> <p>Distinguish correct explanation/reasoning from that which is flawed, and – if there is a flaw in the argument – present corrected reasoning.</p> <ul style="list-style-type: none">Students need not use technical terms such as commutative, associative, distributive, or property.Products and related quotients are limited to the 10x10 multiplication table.																																																																																		
<p>Lesson 3-11 Adding a Group and Lesson 3-12 Subtracting a Group</p> <p>3.OA.A.1. Interpret products of whole numbers, e.g., interpret 5×7 as the total number of objects in 5 groups of 7 objects each. <i>For example, describe a context in which a total number of objects can be expressed as 5×7.</i></p> <p>3.OA.A.3. Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.</p> <p>3.OA.B.5. Apply properties of operations as strategies to multiply and divide.² <i>Examples: If $6 \times 4 = 24$ is known, then $4 \times 6 = 24$ is also known. (Commutative property of multiplication.) $3 \times 5 \times 2$ can be found by $3 \times 5 = 15$, then $15 \times 2 = 30$, or by $5 \times 2 = 10$, then $3 \times 10 = 30$. (Associative property of multiplication.) Knowing that $8 \times 5 = 40$ and $8 \times 2 = 16$, one can find 8×7 as $8 \times (5 + 2) = (8 \times 5) + (8 \times 2) = 40 + 16 = 56$. (Distributive property.)</i></p> <p>3.OA.C.7. Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that $8 \times 5 = 40$, one knows $40 \div 5 = 8$) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.</p>																																																																																		
<p>3.OA.B.5. In these two lessons students are introduced to adding- or subtracting-a-group strategies for deriving new facts from familiar multiplication facts, such as multiplication squares, and 2s, 5s, and 10s facts. Such facts are called “helper facts.” Students use helper facts, together with the equal groups meaning of multiplication, to derive other multiplication facts. In the adding-a-group strategy, students derive an unknown multiplication fact by adding a group to a helper fact. The groups are often represented as arrays. The subtracting-a-group strategy is similar. Students begin with a helper fact and find the unknown multiplication fact by taking one group away from the helper fact.</p> <p>Adding a Group on the Fact Strategy Wall</p> <div><p>Adding a Group Fact: $6 \times 3 = ?$ Helper Fact: $5 \times 3 = 15$</p><table><tr><td>x</td><td>x</td><td>x</td></tr><tr><td>x</td><td>x</td><td>x</td></tr><tr><td>x</td><td>x</td><td>x</td></tr><tr><td>x</td><td>x</td><td>x</td></tr><tr><td>x</td><td>x</td><td>x</td></tr><tr><td>x</td><td>x</td><td>x</td></tr><tr><td>x</td><td>x</td><td>x</td></tr><tr><td>x</td><td>x</td><td>x</td></tr></table><p>I add one group of 3. $15 + 3 = 18$ $6 \times 3 = 18$</p></div>	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	<p>Subtracting a Group on the Fact Strategy Wall</p> <div><p>you can use 5×7 to help figure out 4×7. Solve.</p><p>Sample answer:</p><table><tr><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td></tr><tr><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td></tr><tr><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td></tr><tr><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td></tr><tr><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td></tr><tr><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td></tr><tr><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td></tr><tr><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td></tr></table><p>$5 \times 7 = 35$, $35 - 7 = 28$, so $4 \times 7 = 28$.</p></div>	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	<p>3.OA.B.5 <u>Teaching Student Centered Mathematics</u> The Distributive Property, pg. 66</p> <p>3.OA.C.7 (3s, 4s, 6s, 9s) <u>Activities and Tasks</u> Multiplication No. Wheel Multiplication Challenge I Have Who Has x4 and x6</p>
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Grade 3 Unit Three Operations

Connections/Notes	Additional Resources
<p>Common Misconception: <i>If children start from their first product and add 1 (rather than one group), remind them of the problem's context. Have them act it out with counters or explain their drawings. Encourage children to think about what adding a row or group of objects means.</i></p> <p>Adding a group to a known product is an application of the Distributive Property of Multiplication over Addition. In Unit 5, children will be introduced to the Distributive Property more formally. Implicitly using properties of multiplication is a focus of third grade. These lessons will help students use familiar facts (2s, 5s, and 10s) as helper facts to determine nearby 3s, 4s, 6s, and 9s facts. Helper facts will be revisited in Unit 5 after children have had opportunities to practice adding and subtracting groups.</p> <p>Common Misconception: <i>Watch for children who add on to the wrong factor. For example, to use 2×7 to help with 3×7, they might add a column of 2 to their array, or $14 + 2$. Redirect children by asking: What does 2×7 mean here? 2 rows of 7 What does 3×7 mean? 3 rows of 7 So what do you need to add? Another row of 7</i></p> <p>The adding- and subtracting-a-group strategies for deriving solutions to unknown facts are introduced with visual representations, such as arrays. Allow children to move away from using visual support for these strategies at their own pace, connecting the strategies to number models as they are ready. Given opportunities for meaningful practice with facts, children will apply strategies more efficiently over time.</p> <div data-bbox="1276 792 1417 917" data-label="Diagram"> </div> <p>3.OA.B.5 <i>Base explanations/reasoning on the properties of operations.</i> <i>Example: Knowing that $8 \times 5 = 40$ and $8 \times 2 = 16$ one can find 8×7 as $8 \times (5 + 2) = (8 \times 5) + (8 \times 2) = 40 + 16 = 56$ (Distributive Property)</i></p> <p>MCAP Evidence Statement: The language of the standard should guide the creation of assessment tasks, including the ideas in the given examples.</p> <p>Clarifications:</p> <ul style="list-style-type: none"> • Some tasks have context and other task do not have context. • Products and related quotients are limited to the 10x10 multiplication table • These tasks may not exceed the content limits of grade 3. For example, $2 \times 4 \times 5$, would be acceptable as students can use the associative property to rewrite the expression as $8 \times 5 = 40$, which falls within the content limits of grade 3. The problem $7 \times 4 \times 6$ would exceed the content limits of grade 3 because any use of the associative property would result in a 2-digit multiplier. 	

Grade 3 Unit Three Operations	
Connections/Notes	Additional Resources
Lesson 3-13 Equivalent Names 3.OA.C.7. Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that $8 \times 5 = 40$, one knows $40 \div 5 = 8$) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers. 3.NBT.A.2. Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.	
Lesson 3-13 Students use all four operations to generate equivalent names for numbers. <p>“Name Collection Boxes” are used in this lesson to help students develop flexible ways of thinking about numbers and understanding numeric equivalence. The boxes set up a routine for practicing adding, subtracting, multiplying, and dividing. They also show students that numbers can be represented in a variety of ways and still be equivalent. Students are encouraged to try to use all four arithmetic operations.</p> <p>Example: Name Collection Box for 20</p>	
Lesson 3-14 Unit 3 Assessment	Math GR 3 Unit 3 Summative Assessment in eDoctrina

Grade 3 Unit Four Measurement and Geometry

Connections/Notes

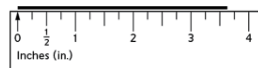
Additional Resources

Lesson 4-1 Measuring with a Ruler and Lesson 4-2 Application Line Plots Lesson

3.MD.B.4. Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units— whole numbers, halves, or quarters.

Lesson 4-1 Students measure to the nearest **half inch** and **centimeter**.

Students use rulers marked with $\frac{1}{4}$ inch increments and use this ruler to measure to the nearest $\frac{1}{2}$ inch. This activity leads to a discussion about precision in measurement and the need for fractional units.



This line segment is about $3\frac{1}{2}$ inches long.



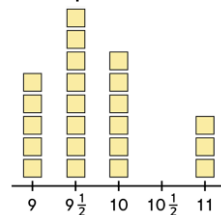
This line segment is about 2 inches long.

Common Misconception: Watch for students who count the tick marks on the ruler when measuring rather than the spaces, or intervals, between the tick marks. Have them gesture by marking intervals with their fingers and counting them along the ruler. You may also wish to have them color the half-inch intervals on the ruler in alternating colors to help them visualize the lengths.

Lesson 4-2 Students generate measurement data and represent the data on a line plot.

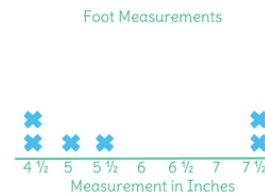
In **Lesson 4-2**, students measure shoelaces and represent the measurement data in line plots. Then they use the line plots to interpret data and answer questions in real-life scenarios. This is students' first experience with a scaled line plot to the half inch.

Example:
Class Shoe Lengths



Line plot with stick-on notes

Name	Measurement in Inches
Ryan	$7\frac{1}{2}$
Emery	$5\frac{1}{2}$
Taryn	$4\frac{1}{2}$
Amauri	$7\frac{1}{2}$
Tenaj	$4\frac{1}{2}$
Turan	5



Data-collection activities are usually more meaningful to children if they come from questions about situations that children really care about. You may wish to further explore real-life problems based on the interests of your class.

3.MD.B.4.

Lessons

Hook Line and Sticker


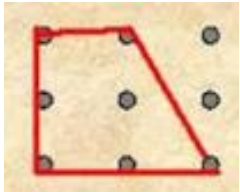
Activities and Tasks

Making a Transparent Ruler

Measuring Strips Line Plot

Grade 3 Unit Four Measurement and Geometry	
Connections/Notes	Additional Resources
<p>3.MD.B.4. MCAP Evidence Statement: The language of the standard should guide the creation of assessment tasks, including the ideas in the given examples. Clarifications:</p> <ul style="list-style-type: none"> • Tasks require students to gather data by measuring lengths using rulers partitioned in halves and fourths of an inch. • Data points on line plots must be represented by an “x” for each data entry. • Tasks then require students to use the data they gathered to create a line plot using the specifications given in the standard. <p>Common Misconception: Watch for children who skip numbers on the scale because no data were collected for that number. Support children in understanding that if no data were collected, the space above that number is simply left blank so you can see the gap in sizes on the graph.</p>	
<p>Lesson 4-3 Exploring Measures of Distance and Comparisons of Mass – Exploration Lesson 3.MD.A.2. Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l).¹ Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem. 3.MD.B.4. Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units—whole numbers, halves, or quarters. 3.MD.D.8. Solve real world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters. 3.NF.A.2. Understand a fraction as a number on the number line; represent fractions on a number line diagram. Represent a fraction $\frac{1}{b}$ on a number line diagram by defining the interval from 0 to 1 as the whole and partitioning it into b equal parts. Recognize that each part has size $\frac{1}{b}$ and that the endpoint of the part based at 0 locates the number $\frac{1}{b}$ on the number line. a) Represent a fraction $\frac{a}{b}$ on a number line diagram by marking off a lengths $\frac{1}{b}$ from 0. Recognize that the resulting interval has size $\frac{a}{b}$ and that its endpoint locates the number $\frac{a}{b}$ on the number line.</p>	
<p>Lesson 4-3 is the exploration lesson for Unit 4. Students measure distances around objects to the nearest $\frac{1}{2}$ inch, compare masses, and determine distances in half-inch increments.</p> <p>Exploration A: Measuring Distances Around Objects Students will measure perimeter to the nearest half inch. Using a variety of measuring tools, and have partners use them to measure distances around small and large objects. Support students as they measure to the nearest $\frac{1}{2}$ inch and record their measurements in their journal.</p>	

Grade 3 Unit Four Measurement and Geometry

Connections/Notes	Additional Resources
<p>In Grade 3, children are expected to find perimeters of polygons. To understand perimeter as the distance around a 2-dimensional figure, children should first explore measuring the distances, or lengths of paths, around concrete 3-dimensional objects. Then children can move more naturally to the concept of measuring the perimeter of 2-dimensional figures. They can also come to understand the perimeter of a polygon as the sum of the lengths of its sides.</p> <p>Exploration B: Comparing Masses Students will compare masses of objects to standard masses to determine benchmarks. Students estimate masses of objects by comparing them to masses of familiar objects, or benchmarks. For example, a liter bottle of water is a benchmark for 1,000 grams, or 1 kilogram. Through this exploration, children will explore objects to use as benchmarks for mass.</p> <p>Exploration C: Traveling Around a Ruler Students will create and compare a variety of triangles on geoboards. In this activity, students move distances in half-inch increments along a ruler (representing fractions on a number line).</p>	<p>Activity Cards 54 & 55</p> 
<p>Lesson 4-4 Polygon Review and Lesson 4-5 Special Quadrilaterals 3.G.A.1. Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.</p> <p>In these two lessons, students review geometric properties of polygons and identify and sketch common polygons. They also explore attributes of quadrilaterals, using mathematical language such as parallel sides and right angles, and classify quadrilaterals into categories and subcategories based on their properties.</p> <p>Lesson 4-4 Students review characteristics of polygons.</p> <p>Common Misconception: <i>Some children may not recognize shapes that are oriented differently from their mental images. By rotating images of familiar shapes, help children recognize that orientation does not impact a shape's characteristics.</i></p> <p>Students will create polygons on their geoboards according to a description. The polygon descriptions provide students with the opportunity to practice using the vocabulary introduced at the end of the last activity. Example: A quadrilateral with one pair of parallel sides. A quadrilateral with one right angle.</p> 	<p>3.G.A.1. Teaching Student Centered Mathematics Sorting & classifying, pgs. 211-213 Lessons Compare and Classify Quadrilaterals Reason about Composing/Decomposing Polygons</p> <p>Activities and Tasks 2-D Shape Sort Comparing Quadrilaterals</p>

Grade 3 Unit Four Measurement and Geometry

Connections/Notes

Lesson 4-5 Students classify quadrilaterals.

Students will classify squares, rectangles, parallelograms, rhombuses, trapezoids, and kites. They will recognize that quadrilaterals may fit into zero, one, or more than one subcategory.

Common Misconception: *Some students may struggle to recognize that certain shapes may fit into more than one quadrilateral subcategory. For example, some may mistakenly suggest that kites must have different-length sides, not recognizing rhombuses as kites. Help them carefully review defining attributes of these shapes as listed on*

3.G.A.1

MCAP Evidence Statement: The language of the standard should guide the creation of assessment tasks, including the ideas in the given examples...



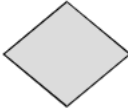
Clarifications:

- Shapes do not include the 90-degree symbol within the shape.

MCAP Sample Question:

The following table shows three shapes. Determine whether each shape is a quadrilateral.

Select one box per row.

Shape	Is a quadrilateral	Is not a quadrilateral
	<input type="radio"/>	<input type="radio"/>
	<input type="radio"/>	<input type="radio"/>
	<input type="radio"/>	<input type="radio"/>

Additional Resources

Templates

Frayer Model

Lesson 4-6 Perimeter, Lesson 4-7 Area and Perimeter, Lesson 4-8 Area and Composite Units, Lesson 4-9 Number Sentences for Area of Rectangles, and Lesson 4-10 Playing Area and Perimeter Game

Grade 3 Unit Four Measurement and Geometry

Connections/Notes	Additional Resources
<p>3.MD.B.4. Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units—whole numbers, halves, or quarters.</p> <p>3.MD.C.5. Recognize area as an attribute of plane figures and understand concepts of area measurement.</p> <p>a) A square with side length 1 unit, called “a unit square,” is said to have “one square unit” of area, and can be used to measure area.</p> <p>b) A plane figure which can be covered without gaps or overlaps by n unit squares is said to have an area of n square units.</p> <p>3.MD.C.6. Measure areas by counting unit squares (square cm, square m, square in, square ft, and improvised units).</p> <p>3.MD.C.7. Relate area to the operations of multiplication and addition.</p> <p>a) Find the area of a rectangle with whole-number side lengths by tiling it, and show that the area is the same as would be found by multiplying the side lengths.</p> <p>b) Multiply side lengths to find areas of rectangles with whole-number side lengths in the context of solving real world and mathematical problems and represent whole-number products as rectangular areas in mathematical reasoning.</p> <p>3.MD.D.8. Solve real world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters.</p> <p>3.G.A.1. Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.</p>	
<p>Lesson 4-6 Students will identify and measure perimeter of rectangles and other polygons. Students will measure perimeters of two-dimensional shapes to the nearest $\frac{1}{2}$ inch, as they develop strategies for determining perimeter.</p> <p>Common Misconception: <i>Watch for children who know they only need the measures of two sides but forgot to add them twice or double them. Have them trace the lengths of two same-size sides. Ask: “What is the length of this side if the other side is ____ long?” Remind children that perimeter is the measure all the way around a shape.</i></p> <p>Lesson 4-7 Students distinguish between perimeter from area. The 1-foot squares are used to measure in two ways in this lesson: length measures in linear units and area measures in square units. Children will use the squares to explore and distinguish between perimeter as a measure of length and area as a measure of amount of surface inside a shape.</p> <p>Have partners create T charts to compare and contrast area and perimeter. Direct students to draw classroom examples of what to measure, such as the border on a bulletin board or window</p> <div data-bbox="1066 1125 1474 1377" data-label="Diagram"> </div>	<p>3.MD.D.8 Lessons Solve a Variety of Word Problems with Perimeter Explore Perimeter Determine Perimeter of Polygons</p> <p>Activities and Tasks Perimeter Word Problems</p> <p>3.MD.C.6 Lessons Array Game Lesson Seed Decompose and Recompose Shapes to Compare Areas Solve a Variety of Word Problems Using All Four</p>

Grade 3 Unit Four Measurement and Geometry

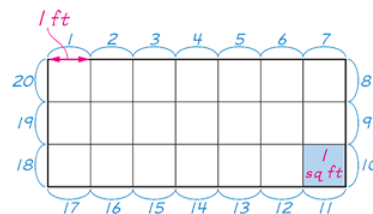
Connections/Notes	Additional Resources
<p>frame. Have them write number models, and use related terms such as: edge, distance, length, sum, boundary, cover, surface, and square units, pointing out similarities and differences between the two. Students should use this information to come up with their own definitions, and then compare their definitions with at least one other partnership and the definitions in their Student Reference Book glossary.</p> <p>Common Misconception: <i>Watch for children who do not understand that corner squares have two adjacent edges that must both be counted when measuring the perimeter of the large rectangle. Emphasize that the edges of the smaller squares make up the edges of the large rectangle. You may wish to have children sketch a picture of the large rectangle filled in with small squares and darken the edge of the large rectangle to make the visual connection.</i></p> <p>Lesson 4-8 Students find the area of a rectangle by using composite units. This lesson introduces the concept of grouping units to form a larger composite unit. Measuring with composite units helps to connect the strategy of skip counting groups of units with the concept of area as space covered.</p> <p>Lesson 4-9 Students find areas of rectangles and write matching number sentences. In this lesson students make connections between counting units of area and their earlier work with arrays and multiplication. They see that the square units inside their rectangles form arrays. They move from counting individual units or skip counting by rows, students learn they can multiply rows and columns of square units to find area. There is a one-to-one correspondence between the dimensions of the array and the lengths of the sides of the rectangle.</p> <div data-bbox="1276 922 1432 1117" data-label="Image"> </div> <p>Lesson 4-10 Students develop strategies for finding area and perimeter. Students will play <i>The Area and Perimeter</i> game. The key to winning the game is being able to distinguish between area and perimeter.</p> <p>Common Misconception: <i>Watch for children who think measures of area and perimeter increase or decrease in relation to each other or that one measure is always larger. Rectangles can have the same area but different perimeters or the same perimeter and different areas.</i></p>	<p>Operations Solve Word Problems Involving Area</p> <p>Activities and Tasks Area Word Problems Finding the Area of Polygons Perimeter and Area Challenge Rectangles with Color Tiles</p>

Grade 3 Unit Four Measurement and Geometry

Connections/Notes	Additional Resources
<p>3.MD.C.5, 6, 7 MCAP Evidence Statement: These standards are instructional and must be taught as they develop important foundational understanding for area measurement. The standards may be used as the content focus for tasks that will assess reasoning and modeling. Clarifications for 3.MD.C.7b:</p> <ul style="list-style-type: none"> • <i>Products are limited to the 10X10 multiplications table.</i> • <i>In the context of real-world mathematical problems.</i> <p>3.MD.D.8. MCAP Evidence Statement: Solve real world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters. Clarifications:</p> <ul style="list-style-type: none"> • <i>Tasks should not exceed computation levels for grade 3.</i> <p>MCAP Sample Questions: A gardener has a rectangular garden.</p> <ul style="list-style-type: none"> • The length of the garden is 6 feet. • The width of the garden is 3 feet. <p>Which expression could be used to find the area, in square feet, of the garden?</p> <p><input type="radio"/> A. $6 + 3$</p> <p><input type="radio"/> B. $6 - 3$</p> <p><input type="radio"/> C. 6×3</p> <p><input type="radio"/> D. $6 \div 3$</p>	

Grade 3 Unit Four Measurement and Geometry

Connections/Notes	Additional Resources
<p>A window is in the shape of a rectangle. The perimeter of the window is 24 feet.</p> <p>Which two pairs of measurements could be the length and width of the window?</p> <p>Select the two correct answers.</p> <p><input type="checkbox"/> A. Length is 4 feet and width is 6 feet</p> <p><input type="checkbox"/> B. Length is 7 feet and width is 5 feet</p> <p><input type="checkbox"/> C. Length is 8 feet and width is 3 feet</p> <p><input type="checkbox"/> D. Length is 9 feet and width is 3 feet</p> <p><input type="checkbox"/> E. Length is 12 feet and width is 12 feet</p> <p><input type="checkbox"/> F. Length is 14 feet and width is 10 feet</p>	
<p>Lesson 4-11 Building a Rabbit Pen Open Response and Re-engagement 2 Days</p> <p>3.MD.C.7. Relate area to the operations of multiplication and addition.</p> <p>b) Multiply side lengths to find areas of rectangles with whole-number side lengths in the context of solving real world and mathematical problems, and represent whole-number products as rectangular areas in mathematical reasoning.</p> <p>3.MD.D.8. Solve real world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters.</p>	
<p>Day 1: Children create and use models of a rabbit pen to solve a problem.</p> <p>For this problem, students use grid paper to create two drawings of a rectangular rabbit pen using 24 feet of fence. They use the models to determine the areas and decide which pen is best for the rabbit.</p> <p>Area = 21 sq. ft.</p> <p>Perimeter = 20 ft.</p>	<p>3.MD.C.7</p> <p>Activities</p> <p>Designing a Flower Bed The Area Stays the Same</p>



Grade 3 Unit Four Measurement and Geometry

Connections/Notes

Additional Resources

Common Misconception: Watch for children who confuse area and perimeter. These children may try to determine the perimeter by counting the number of squares inside the rectangle rather than counting each line segment along the outside edge.

Day 2: Children compare and discuss their models and explanations and revise their work. A rubric can be used to evaluate students' revised work.

Goal for Mathematical Practice GMP4.1	Not Meeting Expectations	Partially Meeting Expectations	Meeting Expectations	Exceeding Expectations
Model real-world situations using graphs, drawings, tables, symbols, numbers, diagrams, and other representations.	Does not draw two models of pens with the correct perimeter.	Draws two models of pens with the correct perimeter, but does not correctly label the area inside the pen, or does not use appropriate mathematical language to explain why the pen was chosen.	Draws two models of pens with the correct perimeter and area labeled inside the pen, and uses appropriate mathematical language to explain why the pen was chosen.	Meets expectations and either draws or compares more than two models of correctly labeled pens or connects the mathematical language to the real world by describing why the chosen pen would be better (for example, the pen is longer, so the rabbit can run farther).

Lesson 4-12 Rectilinear Figures 2 Days

3.OA.C.7. Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that $8 \times 5 = 40$, one knows $40 \div 5 = 8$) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.

3.OA.D.8. Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.

3.MD.C.5. Recognize area as an attribute of plane figures and understand concepts of area measurement.

a) A square with side length 1 unit, called "a unit square," is said to have "one square unit" of area, and can be used to measure area.

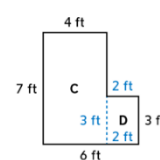
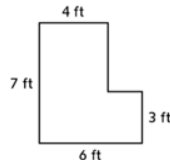
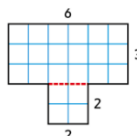
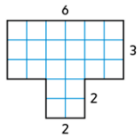
3.MD.C.7. Relate area to the operations of multiplication and addition.

b) Multiply side lengths to find areas of rectangles with whole-number side lengths in the context of solving real world and mathematical problems, and represent whole-number products as rectangular areas in mathematical reasoning.

d) Recognize area as additive. Find areas of rectilinear figures by decomposing them into non-overlapping rectangles and adding the areas of the non-overlapping parts, applying this technique to solve real world problems.

Lesson 4-12 Students find areas of rectilinear figures.

Students extend their strategies for finding area of rectilinear figures – polygons whose sides meet to form right angles – by decomposing them into multiple, nonoverlapping rectangles. Adding the areas of the decomposed parts to find the total area helps students learn that area is additive.



3.MD.C.7.d

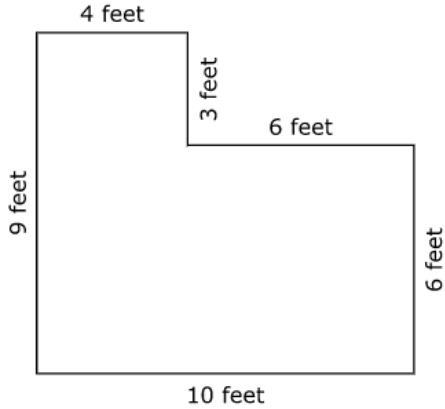
Lessons

Find Area by Decomposing into Rectangles

Activities

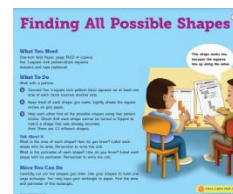
Area of Irregular Figures
Finding the Area of Rectilinear Figures on a Grid

Grade 3 Unit Four Measurement and Geometry

Connections/Notes	Additional Resources
<p>Common Misconception: Watch for children who view the rectilinear figure as having the same area as the 8-by-9 rectangle surrounding it and suggest multiplying 8 times 9 to get the area. Point out the “cutout” area of the rectangle. Explain that 8×9 alone will not work because the shape is not a rectangle; it is not made up entirely of equal rows of squares.</p> <p>3.MD.C.7.d.</p> <p>MCAP Evidence Statement: Recognize area as an additive. Find areas of rectilinear figures by decomposing then into non-overlapping rectangles and adding the areas of the non-overlapping parts, applying this technique to solve real-world problems.</p> <p>Clarifications:</p> <ul style="list-style-type: none"> • Tasks have context. • A rectilinear figure is a polygon in which all angles measure 90 or 270 degrees. • Tasks should not exceed computation levels for grade 3. Products of each component of the composite figure should not be greater than 9×10. (3.NBT.A.3) <p>MCAP Sample Question:</p> <p>The figure shows a garden.</p> <p>The figure is composed of two rectangles that do not overlap.</p>  <p>What is the area, in square feet, of the garden?</p> <p><input type="radio"/> A. 38</p> <p><input type="radio"/> B. 61</p> <p><input type="radio"/> C. 72</p> <p><input type="radio"/> D. 90</p>	<p>The Square Counting Shortcut Three Hidden Triangles</p>
<p>Lesson 4-13 Unit 4 Assessment</p>	<p>Math GR 3 Unit 4 Summative Assessment in eDoctrina</p>

Grade 3 Unit Five Fractions and Multiplication Strategies

Connections/Notes	Additional Resources
<p>Lesson 5-1 Exploring Equal Parts, Fractions of Different Wholes, and Area – Exploration Lesson, Lesson 5-2 Representing Fractions (2 Days), and Lesson 5-3 Equivalent Fractions</p> <p>3.NF.A.1. Understand a fraction $1/b$ as the quantity formed by 1 part when a whole is partitioned into b equal parts; understand a fraction a/b as the quantity formed by a parts of size $1/b$.</p> <p>3.NF.A.3. Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size</p> <ol style="list-style-type: none"> Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line. Recognize and generate simple equivalent fractions, e.g., $1/2 = 2/4$, $4/6 = 2/3$. Explain why the fractions are equivalent, e.g., by using a visual fraction model. Express whole numbers as fractions and recognize fractions that are equivalent to whole numbers. <i>Examples: Express 3 in the form $3 = 3/1$; recognize that $6/1 = 6$; locate $4/4$ and 1 at the same point of a number line diagram.</i> Compare two fractions with the same numerator or the same denominator by reasoning about their size. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with the symbols $>$, $=$, or $<$, and justify the conclusions, e.g., by using a visual fraction model. <p>3.MD.C.6. Measure areas by counting unit squares (square cm, square m, square in, square ft, and improvised units).</p> <p>3.MD.D.8. Solve real world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters.</p> <p>3.G.A.2. Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole. <i>For example, partition a shape into 4 parts with equal area, and describe the area of each part as $1/4$ of the area of the shape.</i></p>	
<p>Lesson 5-1 is the exploration lesson for Unit 5.</p> <p>Students represent fractions as equal parts of different wholes, and they find all shapes with a given area. In this lesson students relate fraction circle pieces to each other, reinforcing fractions as equal parts of a whole. Students use a variety of pieces to represent the whole.</p> <p>Exploration A: Showing Equal Parts Students will explore fraction pieces to determine whether parts of a whole are equal.</p> <p>Exploration B: Finding All Possible Shapes Students will explore different shapes with the same area.</p> <p>Exploration C: Exploring Wholes Students will make sense of different wholes.</p> <p>Lesson 5-2 Students represent fractions using standard notation, words, and drawings. (2 Days)</p>	<p>3.NF.A.1. Teaching Student Centered Mathematics Activities for Flexible Thinking with Whole Numbers, pg. 136 Parts-and-Whole Tasks, pg. 141</p> <p>Lessons Figuring Fractions Folding Flags Specify and Partition a Whole into Equal Parts</p> <p>Activities and Tasks Naming the Whole for a Fraction Pattern Block Combinations for Hexagon</p>




Grade 3 Unit Five Fractions and Multiplication Strategies

Connections/Notes

This lesson formally introduces standard fraction notation. By connecting it with familiar pictorial and physical representations of fractions. Students learn that the **denominator** represents the number of equal parts needed to make 1 whole, and the **numerator** represents the number of parts being considered.

This lesson emphasizes fractions as the quantities formed by 1 part when a whole is partitioned into b equal parts. Each of these parts is a unit fraction, written as 1 over the number of equal parts, $1/b$. For example, the unit fraction $\frac{1}{4}$ represents 1 out of 4 equal parts. When representing non-unit fractions, such as $\frac{3}{4}$, counting each of the three-unit fractions ($\frac{1}{4} + \frac{1}{4} + \frac{1}{4} = \frac{3}{4}$) can help build children's understanding of the relationship between the numerator and the denominator. Explain that a fraction that names one part of the whole, such as 1-sixth, is called a **unit fraction**.

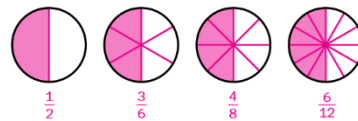
A common misconception is that students think all shapes can be divided the same way. Present shapes other than circles, squares or rectangles to prevent students from over generalizing that all shapes can be divided the same way.

Number of Equal Parts in the Whole	Words for Size of the Parts	Words for One Part of the Whole	Fraction Circles	Number for One Part of the Whole
2	half, halves	1-half, one-half, one out of two equal parts		$\frac{1}{2}$

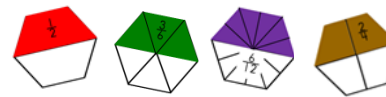
Lesson 5-3 Students recognize equivalent fractions using a visual fraction model.

Students use visual models of same-size wholes to recognize equivalent areas. Fractions are equivalent if they name the same amount of the whole.

Fractions equivalent to 1-half.



Pattern Blocks



3.NF.A.1

MCAP Evidence Statement: The language of the standard should guide the creation of assessment tasks, including the ideas in the given examples. This standard is about understanding unit fractions. Incorporated 3.G.A.2

Clarifications:

- Tasks do not involve the number line.
- For assessment purposes, the types of models that will be used are linear fraction models, such as bar models/tape diagrams or area models. Fraction circles will not be used as models for assessment purposes.
- Tasks should include a variety of the fraction models listed. Not just one type of model.

Additional Resources

Online

[Understanding Fractions](#)

Templates

Dot Geoboard

Fraction Tiles

3.NF.A.3.

Teaching Student Centered Mathematics

Equivalent Fraction Concepts, pg.151

Lessons

Generate Simpler Equivalent Fractions

Activities and Tasks

Fraction Pieces

Equal to Half?

Equivalent Fractions - Tiles

John and Charlie's Run

Fraction Dominoes

3.G.A.2.

Teaching Student Centered Mathematics

Constructing Dissecting Shapes pgs. 214

Activities and Tasks

Geoboard Fourths

Folding Fractions to Fold and Color

Grade 3 Unit Five Fractions and Multiplication Strategies

Connections/Notes	Additional Resources
<ul style="list-style-type: none"> <i>Fractions equivalent to whole numbers are limited to 0 through 5.</i> <i>Tasks are limited to fractions with denominators 2, 3, 4, 6, and 8, however tasks should include the use of all available denominators.</i> <i>Tasks have thin context.</i> <p>3.NF.A.3.a MCAP Evidence Statement: The language of the standard should guide the creation of assessment tasks, including the ideas in the given examples. Clarifications:</p> <ul style="list-style-type: none"> <i>Fractions equivalent to whole numbers are limited to 0 through 5.</i> <i>Tasks are limited to fractions with denominators 2, 3, 4, 6, and 8, Tasks should include the use of all the available denominators.</i> <i>Tasks should include understanding of equivalent fractions if they are the same size and same point on a number line.</i> <p>3.NF.A.3.b MCAP Evidence Statement: The language of the standard should guide the creation of assessment tasks, including the ideas in the given examples. Clarifications:</p> <ul style="list-style-type: none"> <i>Tasks are limited to fractions with denominators 2, 3, 4, 6, and 8; Tasks should include the use of all available denominators.</i> <i>Fractions equivalences are limited to whole numbers 1 through 5.</i> <i>Explain why fractions are equivalent by using visual fraction models.</i> <i>Tasks must use a visual fraction model, such as bar models/tape diagrams, number lines, or area models. No circle fraction models.</i> <p>3.NF.A.3.c MCAP Evidence Statement: The language of the standard should guide the creation of assessment tasks, including the ideas in the given examples. Clarifications:</p> <ul style="list-style-type: none"> <i>Tasks are limited to fractions with denominators 2, 3, 4, 6, and 8. Tasks should include the use of all available denominators.</i> <i>Fractions equivalent to whole numbers are limited to 1 through 5.</i> <i>Explain equivalence to whole numbers by locating the same points on the number line diagram (provide the number line)</i> 	

Grade 3 Unit Five Fractions and Multiplication Strategies

Connections/Notes

Additional Resources

MCAP Sample Questions:

Select the **two** fractions that are equivalent to 1.


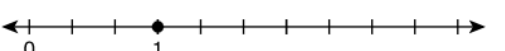
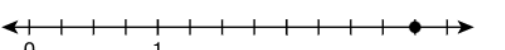
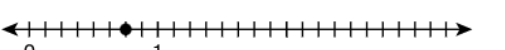
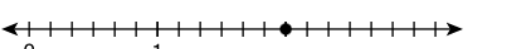
- ☐ A. $\frac{3}{1}$
- ☐ B. $\frac{2}{2}$
- ☐ C. $\frac{4}{3}$
- ☐ D. $\frac{6}{6}$
- ☐ E. $\frac{1}{8}$

Select the **three** choices that are equivalent to $\frac{6}{6}$.

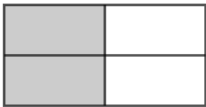
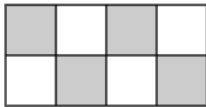
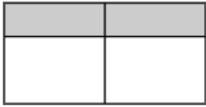
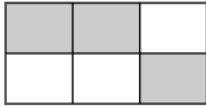
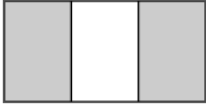
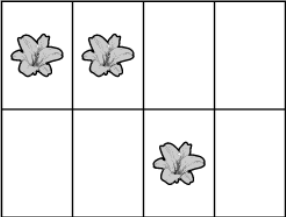
- ☐ A. 1
- ☐ B. $\frac{1}{1}$
- ☐ C. 3
- ☐ D. $\frac{3}{3}$
- ☐ E. $\frac{3}{1}$
- ☐ F. 6

Which **two** number lines show points that represent equivalent fractions?

Select the **two** correct answers.

- ☐ A. 
- ☐ B. 
- ☐ C. 
- ☐ D. 
- ☐ E. 

Grade 3 Unit Five Fractions and Multiplication Strategies

Connections/Notes	Additional Resources
<p>MCAP Sample Questions:</p> <p>In which three figures does the shaded part represent $\frac{1}{2}$ of the figure?</p> <p>Select the three correct answers.</p> <div style="display: flex; flex-wrap: wrap;"> <div style="width: 50%;"> <p><input type="checkbox"/> A. </p> </div> <div style="width: 50%;"> <p><input type="checkbox"/> B. </p> </div> <div style="width: 50%;"> <p><input type="checkbox"/> C. </p> </div> <div style="width: 50%;"> <p><input type="checkbox"/> D. </p> </div> <div style="width: 50%;"> <p><input type="checkbox"/> E. </p> </div> </div> <p>A student divided a sheet of paper into sections of equal size. The student drew flowers on some of the sections as shown.</p> <div style="display: flex; align-items: center;">  <div style="margin-left: 20px;"> <p>On what fraction of the sections of paper did the student draw flowers?</p> <p>Enter your answer as a fraction in the spaces provided.</p> <div style="border: 1px solid black; width: 40px; height: 20px; margin-bottom: 5px;"></div> <div style="border: 1px solid black; width: 40px; height: 20px;"></div> </div> </div>	
<p>Lesson 5-4 Recognizing Helper Facts, Lesson 5-5 Multiplication Facts Strategies: Doubling, Part 1 and Lesson 5-6 Multiplication Facts Strategies: Doubling, Part 2</p> <p>3.OA.A.1. Interpret products of whole numbers, e.g., interpret 5×7 as the total number of objects in 5 groups of 7 objects each. <i>For example, describe a context in which a total number of objects can be expressed as 5×7.</i></p> <p>3.OA.A.3. Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.</p>	

Grade 3 Unit Five Fractions and Multiplication Strategies

Connections/Notes

Additional Resources

3.OA.B.5. Apply properties of operations as strategies to multiply and divide.² *Examples: If $6 \times 4 = 24$ is known, then $4 \times 6 = 24$ is also known. (Commutative property of multiplication.) $3 \times 5 \times 2$ can be found by $3 \times 5 = 15$, then $15 \times 2 = 30$, or by $5 \times 2 = 10$, then $3 \times 10 = 30$. (Associative property of multiplication.) Knowing that $8 \times 5 = 40$ and $8 \times 2 = 16$, one can find 8×7 as $8 \times (5 + 2) = (8 \times 5) + (8 \times 2) = 40 + 16 = 56$. (Distributive property.)*

3.OA.C.7. Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that $8 \times 5 = 40$, one knows $40 \div 5 = 8$) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.

3.OA.D.9. Identify arithmetic patterns (including patterns in the addition table or multiplication table) and explain them using properties of operations. *For example, observe that 4 times a number is always even, and explain why 4 times a number can be decomposed into two equal addends.*

3.MD.C.7. Relate area to the operations of multiplication and addition.

- b) Multiply side lengths to find areas of rectangles with whole-number side lengths in the context of solving real world and mathematical problems and represent whole-number products as rectangular areas in mathematical reasoning.
- c) Use tiling to show in a concrete case that the area of a rectangle with whole-number side lengths a and $b + c$ is the sum of $a \times b$ and $a \times c$. Use area models to represent the distributive property in mathematical reasoning.
- d) Recognize area as additive. Find areas of rectilinear figures by decomposing them into non-overlapping rectangles and adding the areas of the non-overlapping parts, applying this technique to solve real world problems.

Lesson 5-4 Students will use known multiplication facts, called helper facts, to solve harder multiplication facts.

In Unit 3, children learned to start from a well-known helper fact and add or subtract a group to find the product of a new fact. This is an important beginning step in multiplication fact strategy development. Ultimately children need to be able to think of a related helper fact when they are given a fact they do not know. In this lesson, children begin to develop this skill by recognizing which groups of facts their well-known 2s, 5s, and 10s facts can help them solve. The adding a group or subtracting a group strategy relies on the distributive property.

x	0	1	2	3	4	5	6	7	8	9	10
0	0 × 0	1 × 0	2 × 0	3 × 0	4 × 0	5 × 0	6 × 0	7 × 0	8 × 0	9 × 0	10 × 0
1	0 × 1	1 × 1	2 × 1	3 × 1	4 × 1	5 × 1	6 × 1	7 × 1	8 × 1	9 × 1	10 × 1
2	0 × 2	1 × 2	2 × 2	3 × 2	4 × 2	5 × 2	6 × 2	7 × 2	8 × 2	9 × 2	10 × 2
3	0 × 3	1 × 3	2 × 3	3 × 3	4 × 3	5 × 3	6 × 3	7 × 3	8 × 3	9 × 3	10 × 3
4	0 × 4	1 × 4	2 × 4	3 × 4	4 × 4	5 × 4	6 × 4	7 × 4	8 × 4	9 × 4	10 × 4
5	0 × 5	1 × 5	2 × 5	3 × 5	4 × 5	5 × 5	6 × 5	7 × 5	8 × 5	9 × 5	10 × 5
6	0 × 6	1 × 6	2 × 6	3 × 6	4 × 6	5 × 6	6 × 6	7 × 6	8 × 6	9 × 6	10 × 6
7	0 × 7	1 × 7	2 × 7	3 × 7	4 × 7	5 × 7	6 × 7	7 × 7	8 × 7	9 × 7	10 × 7
8	0 × 8	1 × 8	2 × 8	3 × 8	4 × 8	5 × 8	6 × 8	7 × 8	8 × 8	9 × 8	10 × 8
9	0 × 9	1 × 9	2 × 9	3 × 9	4 × 9	5 × 9	6 × 9	7 × 9	8 × 9	9 × 9	10 × 9
10	0 × 10	1 × 10	2 × 10	3 × 10	4 × 10	5 × 10	6 × 10	7 × 10	8 × 10	9 × 10	10 × 10

3.OA.A.1

MCAP Evidence Statement: The language of the standard should guide the creation of assessment tasks, including the ideas in the given examples.

Clarifications:

- The intent of this standard is to interpret multiplication expressions and equations using the definition of multiplication as stated in the standard. It is not to assess calculating products.

3.OA.C.7.

Teaching Student Centered Mathematics

Strategies for Multiplication Facts, pgs. 88-92

Lessons

Snowman at Night (4s, 8s)
Double, Double, Double
Bunny Bump Lesson Seed (2s, 4s, 8s)
Model the Associative Property

Activities and Tasks

Multiplication Number Wheel
Multiplication Challenge

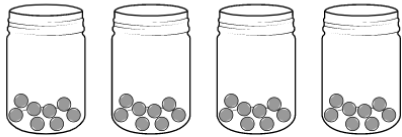
Grade 3 Unit Five Fractions and Multiplication Strategies

Connections/Notes

- Tasks involve interpreting products rather than calculating products in terms of equal groups, arrays, area, and/or measurement quantities. All four representations listed should be used in tasks, not just equal groups.

MCAP Sample questions:

The picture shows marbles in jars.



Which expression could be used to find the total number of marbles in the jars?

- ☐ A. 4×8
- ☐ B. $4 + 8$
- ☐ C. $4 + 4 + 4 + 4$
- ☐ D. $8 + 8 + 8 + 8 + 8 + 8 + 8 + 8$

A farmer has a field with 4 rows of apple trees.

There are 9 trees in each row.

Write an expression that could be used to find the total number of apple trees the farmer has in the field.

Enter your expression in the space provided. Enter **only** your expression.

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Additional Resources

Templates

Blank Multiplication Chart
Clock Flash Cards for the Fives

Grade 3 Unit Five Fractions and Multiplication Strategies

Connections/Notes

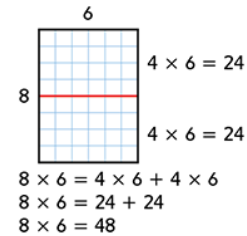
Lesson 5-5 Students explore the use of doubling to solve number stories involving area.

Lesson 5-6 Students use the doubling strategy to solve multiplication facts.

Lessons 5-5 and 5-6 introduce doubling as a multiplication strategy. Students learn that when one factor in a multiplication fact is doubled, the product is doubled. Rectangular area models are used to help students visualize this strategy.

x	0	1	2	3	4	5	6	7	8	9	10
0	0×0	1×0	2×0	3×0	4×0	5×0	6×0	7×0	8×0	9×0	10×0
1	0×1	1×1	2×1	3×1	4×1	5×1	6×1	7×1	8×1	9×1	10×1
2	0×2	1×2	2×2	3×2	4×2	5×2	6×2	7×2	8×2	9×2	10×2
3	0×3	1×3	2×3	3×3	4×3	5×3	6×3	7×3	8×3	9×3	10×3

To solve 8×6 , highlight the idea of breaking the 8-by-6 array into two 4-by-6 arrays.



Students use patterns in doubles facts to solve harder multiplication facts.

3.MD.C.7.b

MCAP Evidence Statement: The language of the standard should guide the creation of assessment tasks, including the ideas in the given examples.

Clarifications:

- Products are limited to the 10x10 multiplications table.
- In the context of real-world mathematical problems.

MCAP Sample Question:

A gardener has a rectangular garden.

- The length of the garden is 6 feet.
- The width of the garden is 3 feet.

Which expression could be used to find the area, in square feet, of the garden?



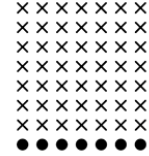
- ☐ A. $6 + 3$
- ☐ B. $6 - 3$
- ☐ C. 6×3
- ☐ D. $6 \div 3$

Additional Resources

Grade 3 Unit Five Fractions and Multiplication Strategies	
Connections/Notes	Additional Resources
Lesson 5-7 Patterns in Products 3.OA.D.9. Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations. <i>For example, observe that 4 times a number is always even, and explain why 4 times a number can be decomposed into two equal addends.</i>	
<p>Students identify and explain arithmetic products using properties of operations. (9s, 5s, 10s)</p> <p>By studying patterns and relationships in multiplication facts and relating multiplication and division, students build a foundation for fluency with multiplication and division facts. Students demonstrate fluency with multiplication facts that have products to 100 and the related division facts. Multiplying and dividing fluently refers to knowledge of procedures, knowledge of when and how to use them appropriately, and skill in performing them flexibly, accurately, and efficiently.</p> <p>Students need ample opportunities to observe and identify important numerical patterns related to operations. Students investigate multiplication tables in search of patterns and explain why these patterns make sense mathematically. For example:</p> <ul style="list-style-type: none"> • The multiples of 4, 6, 8, and 10 are all even because they can all be decomposed into two equal groups. • The doubles (2 addends the same) in an addition table fall on a diagonal while the doubles (multiples of 2) in a multiplication table fall on horizontal and vertical lines. • The multiples of any number fall on a horizontal and a vertical line due to the commutative property. • All the multiples of 5 end in a 0 or 5 while all the multiples of 10 end with 0. Every other multiple of 5 is a multiple of 10. <p>3.OA.D.9 Evidence Statement: The language of the standard should guide the creation of assessment tasks, including the ideas in the given examples. Clarifications:</p> <ul style="list-style-type: none"> • <i>Tasks focus on identifying arithmetic patterns (including patterns in the addition table or multiplication table). Describing or explaining the patterns can be based on properties of operations or patterns on the addition or multiplication tables.</i> 	<p>3.OA.D.9. <u>Teaching Student Centered Mathematics</u> Factor Patterns Activity 2.23, pg. 64 Patterns in the Nines Facts Activity 3.8, pg. 90</p> <p><u>Lessons</u> Identify Patterns in Multiplication and Division Facts</p> <p><u>Activities and Tasks</u> Patterns in the Multiplication Table</p> <p>MCAP Sample Question:</p>

Grade 3 Unit Five Fractions and Multiplication Strategies	
Connections/Notes	Additional Resources
<p>MCAP Sample Question: What is the result when an even number is multiplied by 5?</p> <p>Select from the lists of choices to complete the statement.</p> <p>The result will always be an <input type="text" value="Choose..."/> number, and the digit in the ones place will always be <input type="text" value="Choose..."/>.</p>	
<p>Lesson 5-8 Finding Missing Factors</p> <p>3.OA.A.4. Determine the unknown whole number in a multiplication or division equation relating three whole numbers. <i>For example, determine the unknown number that makes the equation true in each of the equations $8 \times ? = 48$, $5 = _ \div 3$, $6 \times 6 = ?$</i></p> <p>3.OA.B.6. Understand division as an unknown-factor problem. <i>For example, find $32 \div 8$ by finding the number that makes 32 when multiplied by 8.</i></p> <p>3.OA.C.7. Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that $8 \times 5 = 40$, one knows $40 \div 5 = 8$) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.</p>	
<p>Students play <i>Salute!</i> to find missing factors. Students will play <i>Salute!</i> to practice recognizing the missing factors in multiplication facts, just as they did with the Fact Triangles.</p> <p>3.OA.B.6.</p> <p>MCAP Evidence Statement: The entire standard provides the content for assessment.</p> <p>Clarification:</p> <ul style="list-style-type: none"> All products and related quotients are from the harder three quadrants of the times table ($a \times b$ where $a > 5$ and/or $b > 5$). <p>3.OA.C.7</p> <p>MCAP Evidence Statement: For assessment, this standard is divided by operation. 3.OA.C.7-1 tasks will only address multiplication within 100 for fluency. The word fluency does not mean instant recall (automaticity). Fluency means the recall of facts involves accuracy, efficiency, and flexibility. The standard focuses on the strategies commonly used to find the products.</p> <p>Clarifications:</p> <ul style="list-style-type: none"> Tasks assess the entire standard except for the last sentence, "By end of grade 3, know from memory all products of two one-digit numbers." Tasks do not have a context. 	

Grade 3 Unit Five Fractions and Multiplication Strategies

Connections/Notes	Additional Resources
<ul style="list-style-type: none"> • <i>Tasks are not timed.</i> • <i>Tasks may include how the mental math strategies, properties of operations, or relationships between and among operations are used to multiply whole numbers with factors with products within 100.</i> • <i>This standard should only be used for content problems. This standard is not appropriate as the content focus for reasoning and modeling tasks since a calculator is available for computation on modeling and reasoning tasks.</i> <p>MCAP Sample Question:</p> <p style="padding-left: 40px;">Complete each of the following three equations.</p> <p style="padding-left: 40px;">Enter your three answers in the spaces provided.</p> <p style="padding-left: 40px;">$8 \times \boxed{} = 48$</p> <p style="padding-left: 40px;">$\boxed{} = 21 \div 3$</p> <p style="padding-left: 40px;">$45 \div 9 = \boxed{}$</p>	
<p>Lesson 5-9 Multiplication Facts Strategies: Near Squares</p> <p>3.OA.B.5. Apply properties of operations as strategies to multiply and divide.²</p> <p>3.OA.C.7. Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that $8 \times 5 = 40$, one knows $40 \div 5 = 8$) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.</p> <p>3.OA.D.9. Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations. <i>For example, observe that 4 times a number is always even, and explain why 4 times a number can be decomposed into two equal addends.</i></p>	
<p>Students use square products to find products of near squares.</p> <p>In this lesson, students will use the adding- and subtracting-a-group strategies to use helper square facts to derive near squares. This is not a new strategy, but rather an application of adding- or subtracting-a-group strategies to a different set of helper facts.</p> <p>For children who struggle with adding or subtracting a group from a known fact, model the strategy with a square product as a helper fact. Display a 7-by-7 array so you can either add a group by drawing another row of 7 to solve 8×7, or subtract a group by crossing off one row of 7 to solve 6×7.</p>	<div style="display: flex; justify-content: space-around; align-items: flex-end;"> <div style="text-align: center;">  <p>$6 \times 7 = 42$</p> </div> <div style="text-align: center;">  <p>$7 \times 7 = 49$</p> </div> <div style="text-align: center;">  <p>$8 \times 7 = 56$</p> </div> </div>

Grade 3 Unit Five Fractions and Multiplication Strategies	
Connections/Notes	Additional Resources
Lesson 5-10 Button Dolls: Solving a Number Story <i>Open Response and Reengagement</i> 2 Days 3.OA.A.2. Interpret whole-number quotients of whole numbers, e.g., interpret $56 \div 8$ as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each. <i>For example, describe a context in which a number of shares or a number of groups can be expressed as $56 \div 8$</i> 3.OA.A.3. Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.	
Day 1: Students make sense of and solve a mystery story involving multiples and equal groups. Day 2: Students compare solutions and explanations and revise their work. For children who have trouble getting started, provide counters to facilitate grouping and suggest showing the buttons with the counters in an organized way, such as in a 2-by-4 array or one row of 8. Encourage them to see how many dolls they can make using one package of buttons, then two packages, and so on, using any leftovers as they go until there are none left.	
Lesson 5-11 Multiplication Facts Strategies: Break-Apart Strategy 3.OA.A.1. Interpret products of whole numbers, e.g., interpret 5×7 as the total number of objects in 5 groups of 7 objects each. <i>For example, describe a context in which a total number of objects can be expressed as 5×7.</i> 3.OA.A.3. Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem. 3.OA.B.5. Apply properties of operations as strategies to multiply and divide. ² <i>One can find 8×7 as $8 \times (5 + 2) = (8 \times 5) + (8 \times 2) = 40 + 16 = 56$. (Distributive property.)</i> 3.OA.C.7. Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that $8 \times 5 = 40$, one knows $40 \div 5 = 8$) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers. 3.MD.C.7. Relate area to the operations of multiplication and addition. <ul style="list-style-type: none"> b) Multiply side lengths to find areas of rectangles with whole-number side lengths in the context of solving real world and mathematical problems and represent whole-number products as rectangular areas in mathematical reasoning. c) Use tiling to show in a concrete case that the area of a rectangle with whole-number side lengths a and $b + c$ is the sum of $a \times b$ and $a \times c$. Use area models to represent the distributive property in mathematical reasoning. d) Recognize area as additive. Find areas of rectilinear figures by decomposing them into non-overlapping rectangles and adding the areas of the non-overlapping parts, applying this technique to solve real world problems. 	

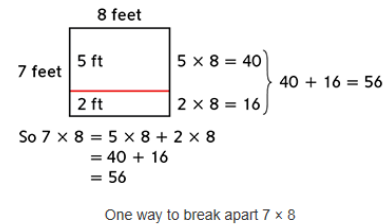
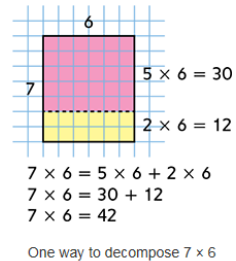
Grade 3 Unit Five Fractions and Multiplication Strategies

Connections/Notes

Students decompose (or break-apart) factors to solve multiplication facts.

The sequence of multiplication facts strategies culminates with the **break-apart strategy**. Students decompose one factor of a challenging multiplication fact to create two easier helper facts. They tile arrays and create area models to illustrate their steps.

Break-Apart Strategy:



3.OA.B.5

MCAP Evidence Statement: The language of the standard should guide the creation of assessment tasks, including the ideas in the given examples.

Clarifications:

- Some tasks have context and other task do not have context.
- Products and related quotients are limited to the 10x10 multiplication table
- These tasks may not exceed the content limits of grade 3. For example, $2 \times 4 \times 5$, would be acceptable as students can use the associative property to rewrite the expression as $8 \times 5 = 40$, which falls within the content limits of grade 3. The problem $7 \times 4 \times 6$ would exceed the content limits of grade 3 because any use of the associative property would result in a 2-digit multiplier.

Additional Resources

3.OA.B.5.

Lessons

Apply the Distributive Property
 Apply the distributive Property to
 Decompose Units

Activities and Tasks

Lucky Sevens
 Split a Factor
 Modeling the Distributive Property
 using Playing Cards

Template

Distributive Property

Grade 3 Unit Five Fractions and Multiplication Strategies	
Connections/Notes	Additional Resources
<p>MCAP Sample Questions:</p> <p>A student wrote the expression $7 + 7 + 7 + 7 + 7$ to find the value of 7×5.</p> <p>The student said that when writing a different expression to represent 7×5, only the numbers 7 and 5 can be used.</p> <p>Which two expressions could be used to show that the student's response is incorrect?</p> <p>Select the two correct answers.</p> <p><input type="checkbox"/> A. 5×7</p> <p><input type="checkbox"/> B. $(4 + 5) \times (3 + 5)$</p> <p><input type="checkbox"/> C. $(4 \times 5) + (3 \times 5)$</p> <p><input type="checkbox"/> D. $(7 + 3) \times (7 + 2)$</p> <p><input type="checkbox"/> E. $(7 \times 3) + (7 \times 2)$</p> <p>Common Misconception: Watch for children who decompose side lengths into factors instead of two addends. For example, a child might break apart 8 into 4×2 rather than $4 + 4$ or two other addends that sum to 8. Support children by using centimeter cubes to build a 2-by-8 rectangle and break it into two 2-by-4 rectangles. Connect this to the number model $2 \times 8 = 2 \times 4 + 2 \times 4$, highlighting that they multiply the side length measuring 2 centimeters by 4 two times.</p>	<p>An expression is shown.</p> <p>3×10</p> <p>Which two expressions have the same value as the given expression?</p> <p>Select the two correct answers.</p> <p><input type="checkbox"/> A. $3 \times (2 + 5)$</p> <p><input type="checkbox"/> B. $3 \times (5 + 5)$</p> <p><input type="checkbox"/> C. $(3 \times 2) + (3 \times 5)$</p> <p><input type="checkbox"/> D. $(3 \times 5) + (3 \times 5)$</p> <p><input type="checkbox"/> E. $(3 \times 5) \times (3 \times 5)$</p>
Lesson 5-12 Unit 5 Assessment	Math GR 3 Unit 5 Summative Assessment in eDoctrina

Grade 3 Unit Six More Operations

Connections/Notes	Additional Resources
<p>Lesson 6-1 Trade-First Subtraction</p> <p>3.OA.D.8. Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.</p> <p>3.NBT.A.2. Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.</p> <p>Students use the trade-first method to solve subtraction problems.</p> <p>In this lesson, students are introduced to first-trade subtraction, an efficient subtraction method similar to the U.S. traditional standard algorithm. With this method, students make all the trades before all the subtraction, allowing them to focus on one thing at a time.</p> <p>Students use expand and trade method first and then move to the trade-first method. The trade-first method makes all the trades before students do any subtraction.</p> <div style="display: flex; justify-content: space-around; margin-top: 20px;"> <div style="text-align: center;"> <p>Expand and Trade Method</p> $\begin{array}{r} 120 \\ 100 \quad \cancel{1}30 \quad 11 \\ 231 \rightarrow 200 + 30 + 1 \\ -174 \rightarrow 100 + 70 + 4 \\ \hline 0 + 50 + 7 = 57 \end{array}$ </div> <div style="text-align: center;"> <p>Trade- First Method</p> $\begin{array}{r} 9 \\ 3 \quad \cancel{1}0 \quad 16 \\ \cancel{4} \quad \cancel{0} \quad \cancel{6} \\ -3 \quad 8 \quad 9 \\ \hline 1 \quad 7 \end{array}$ </div> </div> <p>Common Misconception: Watch for children who struggle to make trades when 0 is a digit in the minuend or subtrahend. Encourage them to write 406 in expanded notation ($406 = 400 + 0 + 6$). When trading 1 hundred for 10 tens, the 0 is crossed out to become 10 tens. Ask: “Are 10 tens the same as 100?” Yes. If children first attempt to trade a 10 for 10 ones and find this is impossible, point to the expanded notation. Say: “You don’t have any tens to trade. Could you trade a 100 to get some tens?” Yes. I could trade one 100 for 10 tens. Point out that once they have done this, they will be able to trade one of the tens for 10 ones.</p> <p>3.OA.D.8 MCAP Evidence Statement: The language of the standard should guide the creation of assessment tasks, including the ideas in the given examples.</p> <p>Clarifications:</p>	

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Connections/Notes

- *Tasks must be two-step problems using any of the four operations.*
- *Tasks will allow students to represent their solution path using equations with a letter for the unknown quantity*
- *Tasks include two out of the four operations and any of the problem situation types with unknowns in various positions.*

3.NBT.A.2 MCAP Evidence Statement: The language of the standard should guide the creation of assessment tasks, including the ideas in the given examples.

Fluency is defined as the means to find the answer to multi-digit numbers using methods that include accuracy, efficiency, and flexibility of thinking. The standard focuses on the strategies commonly used to find the answers when adding or subtracting within 1000.

Clarifications:

- *Tasks should be written to equally focus on both addition and subtraction within 1000.*
- *Tasks have little to no context.*
- *Not all of the tasks should require just an answer. There should be tasks that reflect commonly used strategies as named in the standard.*
- *Tasks include numbers with sums not greater than 1000.*
- *This standard should only be used for content problems. This standard is not appropriate as the content focus for reasoning and modeling tasks since a calculator is available for computation on modeling and reasoning tasks.*

MCAP Sample Question:

Wylie Elementary School has students in 1st through 6th grade.

The table shows the number of present and absent students for different grades on a certain day.

School Attendance

Grade	Number of Students Present	Number of Students Absent
2 nd grade	85	14
3 rd grade	104	13
4 th grade	96	18

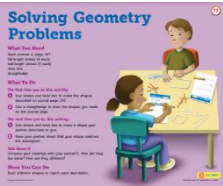
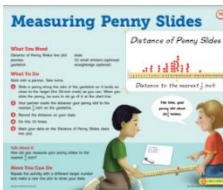
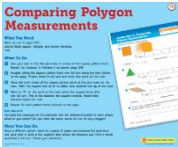
Which **two** questions could be answered based on the information in the table?

Select the **two** correct answers.

- ☐ A. What is the total number of students in the school?
- ☐ B. What is the total number of students who are in the 1st grade?
- ☐ C. What is the total number of students who are in the 4th grade?
- ☐ D. What is the total number of absent students on that day in the 2nd grade and the 3rd grade?
- ☐ E. What is the total number of present students on that day in the 5th grade and the 6th grade?

Grade 3 Unit Six More Operations	
Connections/Notes	Additional Resources
<p>Lesson 6-2 Playing Baseball Multiplication, Lesson 6-3 Taking Inventory of Known Facts Strategies, and Lesson 6-4 Fact Power and Beat the Calculator</p> <p>3.OA.A.4. Determine the unknown whole number in a multiplication or division equation relating three whole numbers. <i>For example, determine the unknown number that makes the equation true in each of the equations $8 \times ? = 48$, $5 = _ \div 3$, $6 \times 6 = ?$</i></p> <p>3.OA.B.5. Apply properties of operations as strategies to multiply and divide.² <i>Examples: If $6 \times 4 = 24$ is known, then $4 \times 6 = 24$ is also known. (Commutative property of multiplication.) $3 \times 5 \times 2$ can be found by $3 \times 5 = 15$, then $15 \times 2 = 30$, or by $5 \times 2 = 10$, then $3 \times 10 = 30$. (Associative property of multiplication.) Knowing that $8 \times 5 = 40$ and $8 \times 2 = 16$, one can find 8×7 as $8 \times (5 + 2) = (8 \times 5) + (8 \times 2) = 40 + 16 = 56$. (Distributive property.)</i></p> <p>3.OA.C.7. Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that $8 \times 5 = 40$, one knows $40 \div 5 = 8$) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.</p>	
<p>Lesson 6-2 Students play <i>Baseball Multiplication</i> to build facts fluency.</p> <p>Lesson 6-3 Students use square products as helper facts to find products of near squares. Students develop their flexibility with multiplication strategies by working in small groups with the final set of Fact Triangles (4×6, 4×7, 4×8, 6×8, 6×7, and 7×8), and by identifying two or more strategies that could be used to solve each fact.</p> <p>The Common Core State Standards defines procedural fluency as “skill in carrying out procedures flexibly, accurately, efficiently and appropriately.” Students discussed the efficiency of facts strategies in previous units. In this lesson, students become more flexible in identifying and using appropriate and efficient strategies for solving facts. This flexibility will help students develop automaticity with basic facts and solve multi digit multiplication problems in future lessons.</p> <p>Lesson 6-4 Students self-assess their automaticity with multiplication facts. Students use a calculator and discover that when they are automatic with multiplication facts, they can solve multiplication facts and division facts faster than using a calculator.</p>	<p>3.OA.A.4. Lessons Find and Interpret the Unknown in Multiplication and Division</p> <p>Activities and Tasks Missing Numbers Multiplication What is the Missing Number?</p>
<p>Lesson 6-5 Exploring Geometry Problems, Measurement Data, and Polygons – Exploration Lesson</p> <p>3.G.A.1. Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.</p> <p>3.MD.B.4. Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units— whole numbers, halves, or quarters.</p> <p>3.MD.D.8. Solve real world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters.</p>	

Grade 3 Unit Six More Operations

Connections/Notes	Additional Resources
<p>Students construct quadrilaterals, measure and plot distances to the nearest $\frac{1}{2}$ inch, and compare perimeter measurements of polygons.</p> <p>Lesson 6-5 is the exploration lesson for Unit Six.</p> <p>Exploration A: Solving Geometry Problems Students will create straw and twist-tie quadrilaterals to match written descriptions.</p> <p>Exploration B: Measuring Penny Slides Students will slide pennies toward a target and record the distances on a line plot.</p> <p>Exploration C: Comparing Polygon Measurements Students find the perimeter of polygons.</p> <div style="display: flex; justify-content: space-around; align-items: center;">    </div>	<p>3.MD.D.8. Lessons Determine Perimeter with Missing Measurements Constant Perimeters Solve a Variety of Word Problems</p>
<p>Lesson 6-6 Multiplication and Division Diagrams</p> <p>3.OA.A.2. Interpret whole-number quotients of whole numbers, e.g., interpret $56 \div 8$ as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each. <i>For example, describe a context in which a number of shares or a number of groups can be expressed as $56 \div 8$</i></p> <p>3.OA.A.3. Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem</p> <p>3.OA.A.4. Determine the unknown whole number in a multiplication or division equation relating three whole numbers. <i>For example, determine the unknown number that makes the equation true in each of the equations $8 \times ? = 48$, $5 = _ \div 3$, $6 \times 6 = ?$</i></p> <p>3.OA.B.6. Understand division as an unknown-factor problem.</p>	
<p>Students use multiplication/division diagrams to make sense of and solve number stories.</p> <p>Students will determine answers to division problems by applying multiplication facts and strategies. A multiplication and division diagram is introduced. To help students make sense of and organize the information in the stories.</p> <p>Example: <i>There are 6 fruit bowls and a total of 54 oranges to divide equally among the bowls. How many oranges should be placed in each bowl?</i> 9 oranges</p>	<p>3.OA.B.6. Lessons: Division as Unknown Factor Problems Division as the Unknown Factor in Multiplication</p>

Grade 3 Unit Six More Operations

Connections/Notes

Additional Resources

Have children organize the story information in a multiplication/division diagram and represent the situation with a number model. Remind them to choose a letter to represent the unknown quantity. In the diagram below, B represents the number of oranges per bowl.

fruit bowls	oranges per bowl	oranges in all
6	B	54

Sample equations: $6 \times B = 54$; $54 \div B = 6$

Common Misconception: Watch for children who fill in multiplication/division diagrams without first making sense of the problem. Support them by asking questions from the *Guide to Solving Number Stories* to check whether their diagram fits the number story.

3.OA.A.2

MCAP Evidence Statement: The language of the standard should guide the creation of assessment tasks, including the ideas in the given examples.

Clarifications:

- The intent of this standard is to interpret division expressions and equations using the definition of division as stated in the standard. It is not to assess calculating quotients.
- Tasks involve interpreting quotients rather than calculating quotients in terms of equal groups, arrays, area, and/or measurement quantities. - See the table for Multiplication and Division Situations found on page 18 of this document.
- Tasks involve interpreting quotients rather than calculating quotients in terms of equal groups, arrays, area, and/or measurement quantities. All representations should be used in tasks, not just equal groups.
- Half the tasks require interpreting quotients as a number of objects in each share and half require interpreting quotients as a number of equal shares. (Both Partitive and Measurement division types)

3.OA.A.3

MCAP Evidence Statement: For assessment, this standard has been divided into two sections one for each operation.

Grade 3 Unit Six More Operations	
Connections/Notes	Additional Resources
<p>3.OA.A.3-1 only focuses on multiplication within 100 with both factors being less than or equal to 10 The intent of the standard is for students to solve word problem types listed in the table of Multiplication and Division Situations found in the back of this document.</p> <p>Clarifications for both multiplication and division:</p> <ul style="list-style-type: none"> • Tasks should not include a symbol for the unknown. This concept will be assessed in 3.OA.A.4 using a symbol for the unknown. • Tasks should require students to represent the context of a multiplication or division problem with a correct equation. (Answers must be given.) • Context may include word and/or an assortment of visual models using equal groups, arrays, or area models. • Must have context for a single-step word problem • If students are asked to identify the equation that matches the problem situation, a variety of equation representations should be used, such as ($5 \times 8 = 40$ or $40 = 5 \times 8$, etc.) <p>3.OA.A.3-2 only focuses on division within 100 with both factors less than or equal to 10</p> <p>MCAP Sample Questions: A teacher arranged 42 bottle caps into 7 rows with the same number of bottle caps in each row. Which expression can be used to find the number of bottle caps the teacher put in each row?</p> <p><input type="radio"/> A. $42 \div 7$</p> <p><input type="radio"/> B. $42 \div 6$</p> <p><input type="radio"/> C. 42×7</p> <p><input type="radio"/> D. 42×6</p>	

Grade 3 Unit Six More Operations

Connections/Notes

Additional Resources

A teacher is making supply boxes for her students to use when they work in groups.

- There are 9 supply boxes.
- Each supply box will have 6 colored markers.
- The teacher has 15 colored markers to put in the supply boxes.

The teacher thinks that 39 more markers are needed to fill the supply boxes because $6 \times 9 = 54$ and $54 - 15 = 39$.

Explain why the teacher's thinking is correct by explaining what the two equations represent in the problem.

Enter your answer and your work or explanation in the space provided. You may also use the drawing tool to help explain or support your answer.



▼ Math symbols

+	−	×	÷
$\frac{\Box}{\Box}$	$\frac{\Box}{\Box}$	()
[]	=	<
>	≠	°	
?			

A gym teacher took some bags of soccer balls to the soccer field.

The teacher put 6 soccer balls in each bag.

What other information is needed to find how many bags of soccer balls the teacher took to the field?

- ☐ A. the total number of students in the gym class
- ☐ B. the total number of players on the school's soccer team
- ☐ C. the total number of soccer balls the teacher took to the field
- ☐ D. the total number of soccer balls each group of students will get

Lesson 6-7 Multiplication with Larger Factors

3.OA.B.5. Apply properties of operations as strategies to multiply and divide.² *Examples: If $6 \times 4 = 24$ is known, then $4 \times 6 = 24$ is also known. (Commutative property of multiplication.) $3 \times 5 \times 2$ can be found by $3 \times 5 = 15$, then $15 \times 2 = 30$, or by $5 \times 2 = 10$, then $3 \times 10 = 30$. (Associative*

Grade 3 Unit Six More Operations

Connections/Notes	Additional Resources
<p><i>property of multiplication.) Knowing that $8 \times 5 = 40$ and $8 \times 2 = 16$, one can find 8×7 as $8 \times (5 + 2) = (8 \times 5) + (8 \times 2) = 40 + 16 = 56$. (Distributive property.)</i></p> <p>3.OA.C.7. Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that $8 \times 5 = 40$, one knows $40 \div 5 = 8$) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.</p> <p>3.OA.D.8. Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.</p> <p>3.OA.D.9. Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations. <i>For example, observe that 4 times a number is always even, and explain why 4 times a number can be decomposed into two equal addends.</i></p>	
<p>Students play Multiplication Top-It and apply strategies to multiply larger factors.</p> <p>Students will extend the scope of multiplication strategies, using them to determine products when one factor is a teen number.</p> <p>Example using Doubling: Twelve is the double of 6. 5×6 is a helper fact.</p>	<div data-bbox="1176 649 1365 836" data-label="Diagram"> </div>
<p>Lesson 6-8 Number Sentences with Parentheses, Lesson 6-9 Writing Number Stories Open Response and Reengagement 2 Days, Lesson 6-10 Order of Operations, and Lesson 6-11 Number Models for Two-Step Number Stories</p> <p>3.OA.C.7. Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that $8 \times 5 = 40$, one knows $40 \div 5 = 8$) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers</p> <p>3.OA.D.8. Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.</p> <p>3.NBT.A.2. Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.</p>	
<p>In these lessons, students will be introduced to grouping symbols and the order of operations, which prepare them to understand how a single number model can contain all of the calculations needed to solve a number story. Parentheses are used to make the meaning clear. Lesson 6-8 Students use parentheses in number sentences.</p> <p>Lesson 6-9 This is the Open Response and Reengagement Lesson for this unit.</p> <p>Day 1: Students write a two-step number story to fit a number sentence. Students will organize the information in the problem in a situation diagram and choose a letter to stand for the unknown quantity. Then they will represent the information in the diagram as a number model. Some</p>	<p>3.OA.D.8. Lessons Solve two-step Word Problems Share and Critique Peer Strategies for Solving Problems</p> <p>Activities and Tasks Multistep Problems Problem Solving PP</p>

Grade 3 Unit Six More Operations

Connections/Notes

students may use a single equation to represent the story, while others may record each step in a series of number models.

Watch for children who write one-step number stories. For example, a child may write a story that matches $12 - 8 = 4$. Encourage them to think about two steps and ask them to match one part of their story with 4×2 and one part with $12 - 8$.

Common Misconception: Watch for children who write one-step number stories.

Day 2: Students analyze others' number stories and revise their work.

Lesson 6-10 Students use the order of operations to solve multistep problems. Students will be introduced to the conventional order of operations.

Rules for the Order of Operations

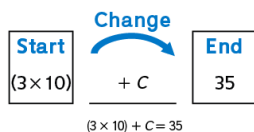
1. Do operations inside parentheses first. Follow Rules 2 and 3 when computing inside parentheses.
2. Then multiply or divide, in order, from left to right.
3. Finally add or subtract, in order, from left to right.

Common Misconception: What for children who incorrectly apply the order of operations when the equal sign is to the left of the operations. Some children might see $______ = 15 - 8 + 6$ and attempt to flip the entire problem, starting at the 6 and working their way to the left. Scaffold for these children by covering the $______ =$ and having them solve the problem from left to right. Explain that it does not matter which side the equal sign is on. When operations are of equal priority, they are always performed from left to right.

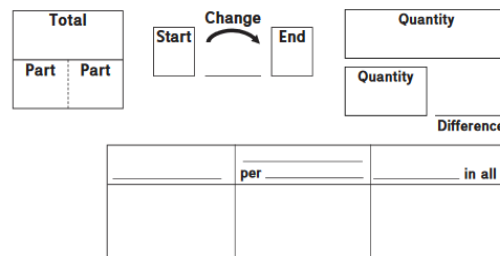
Lesson 6-11 Students solve two-step number stories and represent them with equations.

Remind students that situation diagrams can help them to organize information and write a number model that fits the story.

Example: *Beckett bought 3 boxes of toy cars. Each box contained 10 cars. His friend gave him more cars, so he now has 35. How many toy cars did his friend give him?*



Situation Diagrams



Additional Resources

Two-step Word Problems

Grade 3 Unit Six More Operations	
Connections/Notes	Additional Resources
<p>3.OA.D.8</p> <p>MCAP Evidence Statement: The language of the standard should guide the creation of assessment tasks, including the ideas in the given examples.</p> <p>Clarifications:</p> <ul style="list-style-type: none"> • <i>Tasks must be two-step problems using any of the four operations.</i> • <i>Tasks will allow students to represent their solution path using equations with a letter for the unknown quantity</i> • <i>Tasks include two out of the four operations and any of the problem situation types with unknowns in various positions.</i> <p>3.NBT.A.2</p> <p>MCAP Evidence Statement: The language of the standard should guide the creation of assessment tasks, including the ideas in the given examples.</p> <p>Fluency is defined as the means to find the answer to multi-digit numbers using methods that include accuracy, efficiency, and flexibility of thinking. The standard focuses on the strategies commonly used to find the answers when adding or subtracting within 1000.</p> <p>Clarifications:</p> <ul style="list-style-type: none"> • <i>Tasks should be written to equally focus on both addition and subtraction within 1000.</i> • <i>Tasks have little to no context.</i> • <i>Not all of the tasks should require just an answer. There should be tasks that reflect commonly used strategies as named in the standard.</i> • <i>Tasks include numbers with sums not greater than 1000.</i> • <i>This standard should only be used for content problems. This standard is not appropriate as the content focus for reasoning and modeling tasks since a calculator is available for computation on modeling and reasoning tasks.</i> 	

Grade 3 Unit Six More Operations

Connections/Notes

Additional Resources

MCAP Sample Questions:

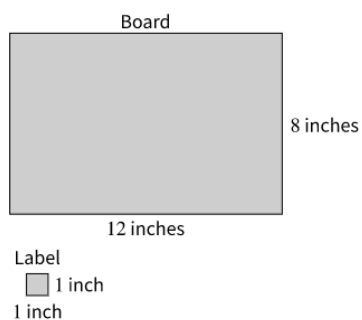
What is the value of the following expression?

$$308 + 97$$

Enter your answer in the space provided.

Rafael will cover a rectangular board with square labels. He will buy packages of square labels. Each package contains 6 labels of the same size.

The following figure shows the side lengths of the board and of one label.



Part A




What is the least number of labels Rafael needs to cover the board? Show your work or explain how you found your answer.

Enter your answer and your work or explanation in the space provided. You may also use the drawing tool to help explain or support your answer.



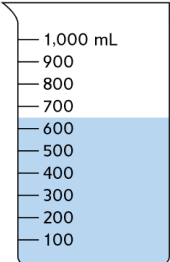
▼ Math symbols

+	-	×	÷
$\frac{\Box}{\Box}$	$\frac{\Box}{\Box}$	()
[]	=	<
>	≠	§	°
?			

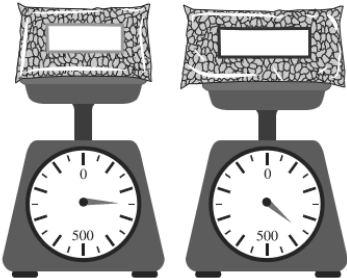
Grade 3 Unit Six More Operations	
Connections/Notes	Additional Resources
<p>Part B</p> <p>What is the least number of packages of labels Rafael should buy? Show your work or explain how you found your answer.</p> <p>Enter your answer and your work or explanation in the space provided. You may use the drawing tool to help explain or support your answer.</p> <div><div></div><div><div></div><div><div>▼ Math symbols</div><div><div><div>+</div><div>-</div><div>×</div><div>÷</div></div><div><div><div><div>□</div><div>□</div></div><div><div>□</div><div>□</div></div></div><div><div>(</div><div>)</div></div><div><div>[</div><div>]</div><div>=</div><div><</div></div><div><div>></div><div>≠</div><div>§</div><div>°</div></div><div><div>?</div></div></div></div></div></div></div>	
Lesson 6-12 Unit 6 Assessment	Math GR 3 Unit 6 Summative Assessment in eDoctrina

Grade 3 Unit Seven Fractions	
Connections/Notes	Additional Resources
<p>Lesson 7-1 Liquid Volume, Lesson 7-2 Exploring Arrays, Volume, and Equal Shares – Exploration Lesson, and Lesson 7-3 Number Stories with Measures</p> <p>3.OA.A.1. Interpret products of whole numbers, e.g., interpret 5×7 as the total number of objects in 5 groups of 7 objects each. <i>For example, describe a context in which a total number of objects can be expressed as 5×7.</i></p> <p>3.OA.A.3. Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem</p> <p>3.OA.C.7. Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that $8 \times 5 = 40$, one knows $40 \div 5 = 8$) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers</p> <p>3.OA.D.8. Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding</p> <p>3.MD.A.1. Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram.</p> <p>3.MD.A.2. Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l).¹ Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem.</p> <p>3.NBT.A.2. Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.</p> <p>3.NBT.A.3. Multiply one-digit whole numbers by multiples of 10 in the range 10–90 (e.g., 9×80, 5×60) using strategies based on place value and properties of operations.</p>	
<p>Lesson 7-1 Students estimate and measure liquid volume.</p> <p>In Lessons 7-1 and 7-2, students measure and estimate liquid volumes in liters and milliliters. Students come to understand that different shaped containers can have the same volumes. Measuring and comparing helps to establish benchmarks for particular measures. Students need multiple opportunities for measuring and estimating liquid volumes that a variety of containers hold. This helps them to better understand that different shaped containers can hold the same volumes and helps prepare them for the unit conversions in grade four.</p> <p>Note: Although only liters and milliliters are used to measure liquid volume in Grade 3, the <i>Student Reference Book</i> includes information about other units of measure, such as quarts, gallons, pints, cups, and ounces. You may wish to discuss these U.S. customary units of measure.</p>	<p>3.MD.A.1. <u>Template</u> Elapsed Time Ruler</p> <p>3.MD.A.2. <u>Lessons</u> Decompose a Liter Decompose to Subtract Measurement</p> <p><u>Activities</u> Estimate and Measure Liquid Volume Volume and Mass Word Problems</p>

Grade 3 Unit Seven Fractions

Connections/Notes	Additional Resources
<p>Lesson 7-2 is the exploration lesson for Unit Seven. Students estimate the number of dots in an array, measure liquid volume, and identify equal shares.</p> <p>Exploration A: Estimating the Number of Dots in an Array</p> <p>Exploration B: Measuring Liquid Volume</p> <p>Exploration C: Identifying Equal Shares</p>  <p>Common Misconception: Watch for children who only identify the representations divided into two same-size and same-shape pieces as the equal shares. Encourage them to count the total number of equal shares on each card. Ask: “How many are shaded? How many are not shaded? Will each person get the same amount of cornbread? Will it be shared equally?” Support children in recognizing different representations of two equal shares.</p> <p>Lesson 7-3 Students solve number stories involving time, mass, volume, and length.</p> <p>3.MD.A.2.</p> <p>MCAP Evidence Statement: The language of the standard should guide the creation of assessment tasks, including the ideas in the given examples.</p> <p>Clarifications:</p> <ul style="list-style-type: none"> • Tasks use drawings such as a beaker with measurement scale or balance scales, etc. to provide information for solving the problem. • Tasks do not require computations beyond the grade 3 expectations. 	<p>Measuring Mass and Volume Mini Metric Olympics Add Measurements Solve Word Problems Using All Four Operations Estimate Differences to Solve Word Problems</p> <p><u>Online</u> Measuring Cylinder</p>

Grade 3 Unit Seven Fractions

Connections/Notes	Additional Resources
<p>MCAP Sample Question:</p> <p>Terry bought 2 bags of beans. The mass of each bag, in grams, is shown on the scales.</p>  <p>How many grams of beans did Terry buy in all?</p> <p>Select one answer.</p> <p><input type="radio"/> A. 700 grams</p> <p><input type="radio"/> B. 650 grams</p> <p><input type="radio"/> C. 600 grams</p> <p><input type="radio"/> D. 550 grams</p>	
<p>Lesson 7-4 Fraction Strips, Lesson 7-5 Fractions on a Number Line, Part 1, Lesson 7-6 Fractions on a Number Line, Part 2, Lesson 7-7 Comparing Fractions, Lesson 7-8 Finding Rules for Comparing Fractions Open Response and Reengagement 2 Days, Lesson 7-9 Locating Fractions on Number Lines, Lesson 7-10 Justifying Fraction Comparisons, Lesson 7-11 Fractions in Number Stories, Lesson 7-12 Fractions of Collections</p> <p>3.OA.A.2. Interpret whole-number quotients of whole numbers, e.g., interpret $56 \div 8$ as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each. <i>For example, describe a context in which a number of shares or a number of groups can be expressed as $56 \div 8$.</i></p> <p>3.NF.A.1. Understand a fraction $1/b$ as the quantity formed by 1 part when a whole is partitioned into b equal parts; understand a fraction a/b as the quantity formed by a parts of size $1/b$.</p> <p>3.NF.A.2. Understand a fraction as a number on the number line; represent fractions on a number line diagram.</p> <p>a) Represent a fraction $1/b$ on a number line diagram by defining the interval from 0 to 1 as the whole and partitioning it into b equal parts. Recognize that each part has size $1/b$ and that the endpoint of the part based at 0 locates the number $1/b$ on the number line.</p> <p>b) Represent a fraction a/b on a number line diagram by marking off a lengths $1/b$ from 0. Recognize that the resulting interval has size a/b and that its endpoint locates the number a/b on the number line</p> <p>3.NF.A.3. Explain equivalence of fractions in special cases and compare fractions by reasoning about their size.</p> <p>a) Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line.</p> <p>b) Recognize and generate simple equivalent fractions, e.g., $1/2 = 2/4$, $4/6 = 2/3$. Explain why the fractions are equivalent, e.g., by using a visual fraction model.</p> <p>c) Express whole numbers as fractions and recognize fractions that are equivalent to whole numbers. <i>Examples: Express 3 in the form $3 = 3/1$; recognize that $6/1 = 6$; locate $4/4$ and 1 at the same point of a number line diagram.</i></p> <p>d) Compare two fractions with the same numerator or the same denominator by reasoning about their size. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with the symbols $>$, $=$, or $<$ and justify the conclusions, e.g. by using a visual fraction model</p>	

Grade 3 Unit Seven Fractions

Connections/Notes

Additional Resources

3.G.A.2. Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole. *For example, partition a shape into 4 parts with equal area, and describe the area of each part as $\frac{1}{4}$ of the area of the shape.*

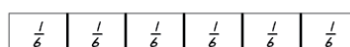
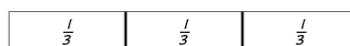
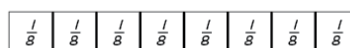
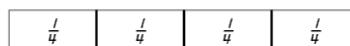
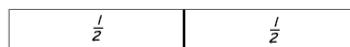
In this unit, students continue to work with fraction circles and are introduced to fraction strips and fraction number lines. They use these tools to determine equivalence and compare relative sizes of fractions.

Lesson 7-4 Students partition fraction strips and use them to name and compare fractions.

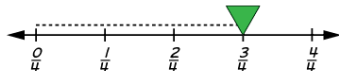
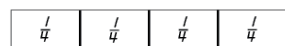
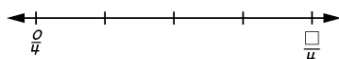
Using fraction strips helps students recognize that non-unit fractions are a count (or sum) of unit fractions. Remind students that fractions that name one part of the whole, like $\frac{1}{2}$ are called **unit fractions**.

$$\frac{2}{8} < \frac{2}{4}$$

Comparing fractions using fraction strips:



Lesson 7-5 Students represent fractions on number lines.



Fractions represent distances on the number line. The whole is established as the distance between 0 and 1.

Children are familiar with two area models of fractions: fraction circles and fraction strips. This lesson introduces the number line as a different model for thinking about fractions. Fractions on a number line are numbers representing distances from 0 to an endpoint. On number lines, the whole is always the distance between two consecutive whole numbers.

Common Misconception: Some children may label their Fraction Number Line Poster the same way they labeled their fraction strips. Emphasize that, unlike fraction strips, they are not labeling the

3.NF.A.1.

Lessons

Build and Write Fractions Greater Than One
What Is the One
Part to Whole and Whole to Part

3.NF.A.2.

Lessons

Place Any Fraction on a Number Line
Fraction Line Up
Place Unit Fractions on a Number Line

Activities and Tasks

Locating Fractions Less than One
Friendly Race
Number Line Roll

3.NF.A.3.

Lessons

Compare Fractions and Whole Numbers by Using a Number Line
Compare Fractions with the Same Numerator
Show Equivalent Fractions
Number Line

Activities and Tasks

Closest to One Half
Comparing Fractions with a Different Whole

Grade 3 Unit Seven Fractions

Connections/Notes

areas, rather, they are labeling distances from zero in the same way numbers are labeled on the Class Number Line. Just as on the numbers on the Class Number Line, children should label the tick marks, not the spaces between the tick marks.

Lesson 7-6 Students identify fractions greater than, less than, and equal to one on a number line.



Some children may count the number of tick marks rather than the number of intervals on the number line. For example, on Number Line A they may count four tick marks and report the denominator of the fraction as 4. To help children visualize that there are three equal parts, shade each space between the tick marks with alternating colors. Then discuss that there are a total of three equal parts from 0 to 1. The point at the end of the second part is two out of three equal parts away from 0, so this point represents the fraction $\frac{2}{3}$.

Circle the fractions greater than 1.



Common Misconception: Some children may count the number of tick marks rather than the number of intervals on the number line.

Lesson 7-7 Students compare fractions using visual models.

Students will compare fractions on number lines by thinking about their locations in relation to the **benchmarks** $\frac{1}{2}$, 0, and 1 and then by using fraction circles and number lines on their fraction cards.

Fraction Benchmarks		
Fractions Less Than $\frac{1}{2}$	Fractions Equal to $\frac{1}{2}$	Fractions Greater Than $\frac{1}{2}$
$\frac{1}{3}, \frac{1}{4}, \frac{2}{6}$	$\frac{2}{4}, \frac{3}{6}, \frac{4}{8}$	$\frac{3}{4}, \frac{7}{8}, \frac{5}{6}$

Lesson 7-8 This is the **Open Response and Re-engagement** lesson for this unit.

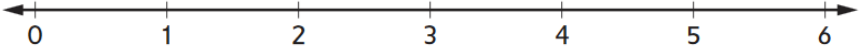
Day 1: Students order fractions with the same numerator and write a rule for ordering similar sets of fractions.

Students will generalize about whether a fraction is greater than or less than $\frac{1}{2}$ and then develop a rule to order fractions with the same numerator.

Additional Resources

Comparing Fractions with Same Numerator
Comparing Fractions with Same Denominator
Comparing Fractions
Ordering Fractions
Spin to Win

Grade 3 Unit Seven Fractions

Connections/Notes	Additional Resources
<p>The focus mathematical practice for this lesson is GMP8.1. Children are asked to write a rule for ordering fractions with the same numerator. In order to create a rule, children need to recognize patterns in sets of fractions with common numerators. Children can recognize that as a fraction's denominator gets larger, the fraction gets smaller when the numerators are the same.</p> <p>Common Misconception: <i>Watch for children who assume fractions with smaller denominators are smaller in size (or that fractions with larger denominators are larger in size). Encourage them to model two fractions using fraction circles.</i></p> <p>Day 2: Students analyze and discuss others' rules and revise their work.</p> <p>Lesson 7-9 Students partition distances to locate fractions on number lines. Students build on experiences and develop an understanding of 0, $\frac{1}{2}$, and 1 as benchmarks when comparing fractions. They determine the fraction's size by considering the relative location of points on a number line.</p> <p>Example: Locate $\frac{8}{3}$ on the number line below. Students will need to partition the number line into thirds, and label $\frac{8}{3}$.</p> <div style="text-align: center;">  </div> <p>On the number line, the whole is the unit interval, that is, the interval from 0 to 1, measured by length. Iterating this whole to the right marks off the whole numbers, so that the intervals between consecutive whole numbers, from 0 to 1, 1 to 2, 2 to 3, etc., are all of the same length.</p> <p>Common Misconception: <i>Watch for children who interpret the entire number line, rather than the distance between two consecutive whole numbers, as the whole. Help children understand that whole numbers can be represented as fractions and that number lines can show more than one whole. (Use example from Math Message problem).</i></p>	

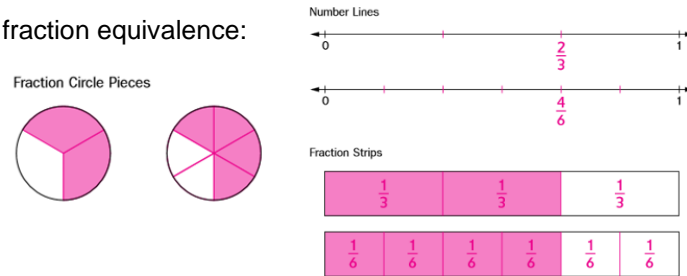
Grade 3 Unit Seven Fractions

Connections/Notes

Additional Resources

Lesson 7-10 Students make and justify fraction comparisons.

Modeling fraction equivalence:



Lesson 7-11 Students solve fraction number stories.

Students may write addition number sentences to model unit fractions being put together to create a larger fraction of the whole (such as $\frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} = \frac{5}{4}$). Third graders are not expected to perform operations with fractions. However, putting smaller fractions together to create a larger fraction or to complete the whole is a natural strategy for children to use when solving fraction number stories.

Lesson 7-12 Students name fractions of sets of objects.

Students think about fractions when the whole is a **collection**.

Example: 6 birds were in a tree. 1 flew away. What fraction flew away? $\frac{1}{6}$ of the birds

What fraction of the birds stayed? $\frac{5}{6}$ of the birds

3.NF.A.1

MCAP Evidence Statement: The language of the standard should guide the creation of assessment tasks, including the ideas in the given examples. This standard is about understanding unit fractions. Incorporated 3.G.A.2

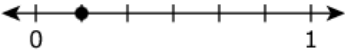
Clarifications:

- Tasks do not involve the number line.
- For assessment purposes, the types of models that will be used are linear fraction models, such as bar models/tape diagrams or area models. Fraction circles will not be used as models for assessment purposes.
- Tasks should include a variety of the fraction models listed. Not just one type of model.

Grade 3 Unit Seven Fractions

Connections/Notes	Additional Resources
<ul style="list-style-type: none"> <i>Fractions equivalent to whole numbers are limited to 0 through 5.</i> <i>Tasks are limited to fractions with denominators 2, 3, 4, 6, and 8, however tasks should include the use of all available denominators.</i> <i>Tasks have thin context.</i> <p>3.NF.A.2b MCAP Evidence Statement: The language of the standard should guide the creation of assessment tasks, including the ideas in the given examples. This is similar to 3.NF.A.2a, but 2b extends fractions representation greater than a unit fraction (1/b). Clarifications</p> <ul style="list-style-type: none"> <i>Tasks should include fractions greater than 1 (example 4/3 or 2 1/8).</i> <i>Fractions equivalent to whole numbers are limited to 0 through 5.</i> <i>Tasks have “thin context”</i> <i>Tasks are limited to fractions with denominators 2, 3, 4, 6, and 8</i> <i>Tasks should include the use of all of the available denominators.</i> <p>3.NF.A.3.a MCAP Evidence Statement: The language of the standard should guide the creation of assessment tasks, including the ideas in the given examples. Clarifications:</p> <ul style="list-style-type: none"> <i>Fractions equivalent to whole numbers are limited to 0 through 5.</i> <i>Tasks are limited to fractions with denominators 2, 3, 4, 6, and 8, Tasks should include the use of all the available denominators.</i> <i>Tasks should include understanding of equivalent fractions if they are the same size and same point on a number line.</i> <p>3.NF.A.3.b MCAP Evidence Statement: The language of the standard should guide the creation of assessment tasks, including the ideas in the given examples. Clarifications:</p> <ul style="list-style-type: none"> <i>Tasks are limited to fractions with denominators 2, 3, 4, 6, and 8; Tasks should include the use of all available denominators.</i> <i>Fractions equivalences are limited to whole numbers 1 through 5.</i> <i>Explain why fractions are equivalent by using visual fraction models.</i> <i>Tasks must use a visual fraction model, such as bar models/tape diagrams, number lines, or area models. No circle fraction models.</i> 	

Grade 3 Unit Seven Fractions

Connections/Notes	Additional Resources
<p>3.NF.A.3.c MCAP Evidence Statement: The language of the standard should guide the creation of assessment tasks, including the ideas in the given examples. Clarifications:</p> <ul style="list-style-type: none"> • Tasks are limited to fractions with denominators 2, 3, 4, 6, and 8. Tasks should include the use of all available denominators. • Fractions equivalent to whole numbers are limited to 1 through 5. • Explain equivalence to whole numbers by locating the same points on the number line diagram (provide the number line). <p>3.NF.A.3.d MCAP Evidence Statement: The language of the standard should guide the creation of assessment tasks, including the ideas in the given examples. Clarifications:</p> <ul style="list-style-type: none"> • Tasks are limited to fractions with denominators 2, 3, 4, 6, and 8. Tasks should include the use of all available denominators. • Fractions equivalent to whole numbers are limited to 1 through 5 • Tasks should note that the fractions being compared have the same whole. • Tasks should focus on justifying a comparison of two fractions based on the same sized whole by using a visual fraction model. • Tasks must use a visual fraction model, such as bar models/tape diagrams, number lines, or area models. No circle fraction models. <p>MCAP Sample Questions:</p> <p>What fraction is represented by the point on the number line?</p>  <p>Enter your answer as a fraction in the spaces provided.</p> <div style="border: 1px solid black; width: 50px; height: 20px; margin-bottom: 5px;"></div> <div style="border: 1px solid black; width: 50px; height: 20px;"></div>	

Grade 3 Unit Seven Fractions

Connections/Notes

Additional Resources

Which comparison is true?

Select one answer.

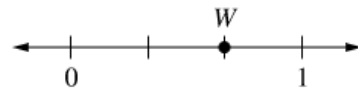
☐ A. $\frac{1}{2} < \frac{1}{3}$

☐ B. $\frac{2}{3} > \frac{2}{4}$

☐ C. $\frac{3}{6} < \frac{1}{6}$

☐ D. $\frac{4}{8} > \frac{5}{8}$

Point W represents a fraction on the number line.




Enter a fraction that is represented by point W .

Enter your answer as a fraction in the spaces provided.



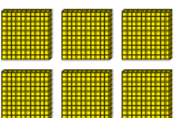
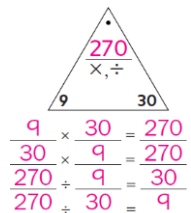
Grade 3 Unit Seven Fractions	
Connections/Notes	Additional Resources
<p>Byron will write a fraction that is equivalent to 1. The denominator is 2.</p> $1 = \frac{\boxed{}}{2}$ <p>What number will Byron use in the numerator to write the fraction?</p> <p>Enter your answer in the space provided.</p> <input type="text"/>	
Lesson 7-13 Unit 7 Assessment	Math GR 3 Unit 7 Summative Assessment in eDoctrina

Grade 3 Unit Eight Multiplication and Division	
Connections/Notes	Additional Resources
<p>Lesson 8-1 Measuring to the Nearest $\frac{1}{4}$ Inch</p> <p>3.NF.A.1. Understand a fraction $\frac{1}{b}$ as the quantity formed by 1 part when a whole is partitioned into b equal parts; understand a fraction $\frac{a}{b}$ as the quantity formed by a parts of size $\frac{1}{b}$.</p> <p>3.NF.A.3. Explain equivalence of fractions in special cases and compare fractions by reasoning about their size.</p> <p>c) Express whole numbers as fractions and recognize fractions that are equivalent to whole numbers. <i>Examples: Express 3 in the form $3 = \frac{3}{1}$; recognize that $\frac{6}{1} = 6$; locate $\frac{4}{4}$ and 1 at the same point of a number line diagram.</i></p> <p>3.MD.B.4. Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units— whole numbers, halves, or quarters.</p>	
Students use rulers to measure to the nearest $\frac{1}{4}$ inch.	<p>3.MD.B.4. Lessons</p> <p>Measuring to the $\frac{1}{4}$ Inch</p> <p>Data with Line Plots</p>


Grade 3 Unit Eight Multiplication and Division

Connections/Notes	Additional Resources
<p>Students will make sense of a new ruler, which is partitioned into 1/8-inch segments. Students increase the precision of their linear measurement by using this ruler to measure to the nearest ¼ inch.</p> 	<p>Represent Data with Line Plots</p>
<p>Lesson 8-2 Extended Facts: Multiplication and Division, Lesson 8-3 Factors of Counting Numbers, Lesson 8-4 Setting Up Chairs - Open Response and Reengagement 2 Days, Lesson 8-5 Paying Factor Bingo, Lesson 8-6 Sharing Money, Lesson 8-7 Exploring Number Lines, Fractions, and Area – Exploration Lesson</p> <p>3.OA.A.2. Interpret whole-number quotients of whole numbers, e.g., interpret $56 \div 8$ as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each. <i>For example, describe a context in which a number of shares or a number of groups can be expressed as $56 \div 8$</i></p> <p>3.OA.A.3. Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.</p> <p>3.OA.A.4. Determine the unknown whole number in a multiplication or division equation relating three whole numbers. <i>For example, determine the unknown number that makes the equation true in each of the equations $8 \times ? = 48$, $5 = _ \div 3$, $6 \times 6 = ?$</i></p> <p>3.OA.B.6. Understand division as an unknown-factor problem. <i>For example, find $32 \div 8$ by finding the number that makes 32 when multiplied by 8.</i></p> <p>3.OA.C.7. Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that $8 \times 5 = 40$, one knows $40 \div 5 = 8$) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.</p> <p>3.NBT.A.2. Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.</p> <p>3.NBT.A.3. Multiply one-digit whole numbers by multiples of 10 in the range 10–90 (e.g., 9×80, 5×60) using strategies based on place value and properties of operations.</p> <p>3.NF.A.1. Understand a fraction $1/b$ as the quantity formed by 1 part when a whole is partitioned into b equal parts; understand a fraction a/b as the quantity formed by a parts of size $1/b$.</p> <p>3.NF.A.2. Understand a fraction as a number on the number line; represent fractions on a number line diagram.</p> <ol style="list-style-type: none"> Represent a fraction $1/b$ on a number line diagram by defining the interval from 0 to 1 as the whole and partitioning it into b equal parts. Recognize that each part has size $1/b$ and that the endpoint of the part based at 0 locates the number $1/b$ on the number line. Represent a fraction a/b on a number line diagram by marking off a lengths $1/b$ from 0. Recognize that the resulting interval has size a/b and that its endpoint locates the number a/b on the number line. <p>3.NF.A.3. Explain equivalence of fractions in special cases and compare fractions by reasoning about their size.</p> <ol style="list-style-type: none"> Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line. 	

Grade 3 Unit Eight Multiplication and Division

Connections/Notes	Additional Resources
<p>b) Recognize and generate simple equivalent fractions, e.g., $\frac{1}{2} = \frac{2}{4}$, $\frac{4}{6} = \frac{2}{3}$). Explain why the fractions are equivalent, e.g., by using a visual fraction model.</p> <p>d) Compare two fractions with the same numerator or the same denominator by reasoning about their size. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with the symbols $>$, $=$, or $<$, and justify the conclusions, e.g., by using a visual fraction model.</p> <p>3.MD.C.7. Relate area to the operations of multiplication and addition.</p>	
<p>Students will deepen and apply their understanding of multiplication and division within 100 in these six lessons.</p> <p>Lesson 8-2 Students develop strategies for solving extended multiplication and division facts.</p> <p>In this lesson, students extend their skill with basic multiplication facts, and develop strategies for multiplying and dividing multiples of 10.</p> <p><u>Professional Development</u> This lesson helps to develop children's understanding of multiplying by a multiple of 10 as finding how many total groups of ten they have. For example, children could think of 8×80 as 8 groups of 8 tens, which is the same as 64 groups of 10, or 640. Some children may discover that one way to find products such as 8×80 is to multiply the nonzero digits ($8 \times 8 = 64$), count the number of zeros in the multiple (one), and attach the zero to the product to get 640. Introducing this strategy too early may discourage children from thinking the problem through and often leads to errors when multiplying decimals in later grades.</p> <p>Problems like 2×30 are called extended facts because a related basic multiplication fact can help them find the number of tens (or hundreds or thousands) in the solution.</p> <div style="display: flex; align-items: center; justify-content: space-around;"> <div style="text-align: center;"> $2 \times 3 =$  </div> <div style="text-align: center;"> $2 \times 30 =$  </div> <div style="text-align: center;"> $2 \times 300 =$  </div> </div> <p style="text-align: center;">Extended facts modeled with base-10 block arrays</p> <div style="text-align: center;">  </div> <p>Lesson 8-3 Students find factors of counting numbers. Students are introduced to factor pairs. Students find factor pairs using fact families, equal grouping, and patterns.</p>	<p>3.MD.C.7 Lessons Floor Plans City Farmers</p>

Grade 3 Unit Eight Multiplication and Division

Connections/Notes	Additional Resources
<p>Lesson 8-4 Open Response and Reengagement Lesson</p> <p>Day 1: Students use clues to make conjectures and arguments the total number of chairs in a room.</p> <p>While proper use of the terms conjecture and argument is not essential for this lesson, it is important for children to see how these two ideas go together. A conjecture is a statement that is thought to be true. An argument uses mathematical reasoning to show whether a conjecture is true or false. When solving a problem, you often start by using information in the problem and your mathematical thinking to make a conjecture for a possible solution. Then you make an argument as to whether the solution works.</p> <p>Day 2: The class discusses some conjectures and arguments, and students revise their work.</p> <p>Lesson 8-5 Students learn to play <i>Factor Bingo</i> and discuss how to find products for a given factor.</p> <p>Common Misconception: <i>Some children may not realize that numbers beyond the basic fact products can be multiples of factors 2-9. Encourage children to think about patterns in products, such as that all even numbers have a factor of 2. Also remind children about extended fact families and multiples of 10.</i></p> <p>Lesson 8-6 Students model equal-sharing situations with \$10 and \$1 bills.</p> <p>Students solve equal-sharing stories about sharing money. They must develop base-10 trading strategies and make sense of remainders. They write division and multiplication number models for the problems, using letters to represent the unknowns.</p> <p>Example: Sharing \$68 equally among 4 people or $68 \div 4$</p> <div style="display: flex; align-items: center; justify-content: center;">  </div> <p>3.OA.A.2</p> <p>MCAP Evidence Statement: The language of the standard should guide the creation of assessment tasks, including the ideas in the given examples.</p> <p>Clarifications:</p> <ul style="list-style-type: none"> The intent of this standard is to interpret division expressions and equations using the definition of division as stated in the standard. It is not to assess calculating quotients. Tasks involve interpreting quotients rather than calculating quotients in terms of equal groups, arrays, area, and/or measurement quantities. - See the table for Multiplication and Division Situations found in the back of this document found in the back of this document 	

Grade 3 Unit Eight Multiplication and Division

Connections/Notes

- Tasks involve interpreting quotients rather than calculating quotients in terms of equal groups, arrays, area, and/or measurement quantities. All representations should be used in tasks, not just equal groups.
- Half the tasks require interpreting quotients as a number of objects in each share and half require interpreting quotients as a number of equal shares. (Both Partitive and Measurement division types)

MCAP Sample Question:

A student has several pennies.

The student organized the pennies into the array shown.

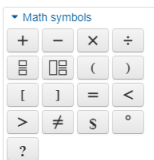


The student wants to put all the pennies in stacks with the same number of pennies in each stack.

Explain three different ways the student could put the pennies in stacks with the same number of pennies in each stack.

Explain how you used the array of pennies to help you find the different ways to stack the pennies.

Enter your answer and your work or explanation in the space provided. You may also use the drawing tool to help explain or support your answer.

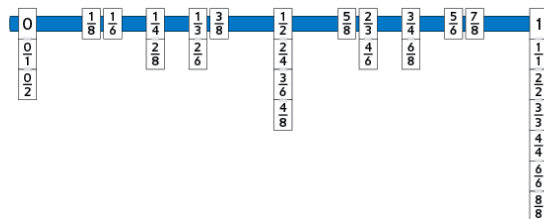


Lesson 8-7 is the exploration lesson for Unit 8.

Students compare fractions, generate equivalent fractions, and explore the areas of rectangles.

Exploration A: Plotting Fractions

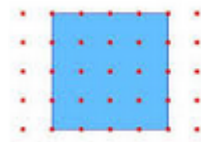
Students use fraction cards to plot fractions on a number line.



Exploration B: Exploring Geoboard Areas

Students create rectangles using given area measures. They create rectangles with a given area, and use their knowledge about factor pairs to determine side lengths.

Area = 16 sq units



Additional Resources

Grade 3 Unit Eight Multiplication and Division	
Connections/Notes	Additional Resources
<p>Exploration C: Exploring Equivalent Fractions Students find equivalent fractions using fraction-circle pieces.</p> <p><i>Common Misconception: Watch for children who count the pegs or dots instead of the spaces when finding side lengths. Have them trace along the section of rubber band between each peg of the figure and count the units in each side length. Emphasize counting the distance from one peg to the next along the side of the rectangle.</i></p>	
<p>Lesson 8-8 Solid Shapes (Optional lesson) It is recommended to complete the Math Boxes in this lesson.</p>	
Lesson 8-9 Unit 8 Assessment	Math GR 3 Unit 8 Summative Assessment in eDoctrina

Grade 3 Unit Nine Multidigit Operations	
Connections/Notes	Additional Resources
<p>Lesson 9-1 Playing Product Pile-Up</p> <p>3.OA.A.1. Interpret products of whole numbers, e.g., interpret 5×7 as the total number of objects in 5 groups of 7 objects each. <i>For example, describe a context in which a total number of objects can be expressed as 5×7</i></p> <p>3.OA.A.4. Determine the unknown whole number in a multiplication or division equation relating three whole numbers. <i>For example, determine the unknown number that makes the equation true in each of the equations $8 \times ? = 48$, $5 = _ \div 3$, $6 \times 6 = ?$</i></p> <p>3.OA.C.7. Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that $8 \times 5 = 40$, one knows $40 \div 5 = 8$) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.</p>	
<p>Students play a game to practice multiplication facts.</p> <p>Students use the above standards in this lesson to play the game Product Pile-Up. It provides practice with multiplication facts and works with the factors from Unit 8. Students generalize and strategize during the game about the factors and multiplication facts.</p> <p>Encourage discussion of factor-product relationships and strategies that could be used to play the game.</p>	

Grade 3 Unit Nine Multidigit Operations

Connections/Notes	Additional Resources
<p>3.OA.C.7 MCAP Evidence Statement: For assessment, this standard is divided by operation. 3.OA.C.7-1 tasks will only address multiplication within 100 for fluency. The word fluency does not mean instant recall (automaticity). Fluency means the recall of facts involves accuracy, efficiency, and flexibility. The standard focuses on the strategies commonly used to find the products. Clarifications:</p> <ul style="list-style-type: none"> • <i>Tasks assess the entire standard except for the last sentence, “By end of grade 3, know from memory all products of two one-digit numbers.</i> • <i>Tasks do not have a context.</i> • <i>Tasks are not timed.</i> • <i>Tasks may include how the mental math strategies, properties of operations, or relationships between and among operations are used to multiply whole numbers with factors with products within 100.</i> • <i>This standard should only be used for content problems. This standard is not appropriate as the content focus for reasoning and modeling tasks since a calculator is available for computation on modeling and reasoning tasks.</i> <p>MCAP Sample Question: Which two equations could be used to find the result of 7×5? Select the two correct answers.</p> <p><input type="checkbox"/> A. $5 \div 35 = 7$</p> <p><input type="checkbox"/> B. $7 \div 35 = 5$</p> <p><input type="checkbox"/> C. $35 \div 7 = 5$</p> <p><input type="checkbox"/> D. $5 + 5 + 5 + 5 + 5 = 35$</p> <p><input type="checkbox"/> E. $7 + 7 + 7 + 7 + 7 = 35$</p>	
<p>Lesson 9-2 Multiply and Divide with Multiples of 10, Lesson 9-3 Mental Math to Multiply, and Lesson 9-5 Multidigit Multiplication 3.OA.A.3. Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem. 3.OA.A.4. Determine the unknown whole number in a multiplication or division equation relating three whole numbers. <i>For example, determine the unknown number that makes the equation true in each of the equations $8 \times ? = 48$, $5 = _ \div 3$, $6 \times 6 = ?$</i></p>	

Grade 3 Unit Nine Multidigit Operations

Grade 3 Unit Nine Multidigit Operations							
Connections/Notes	Additional Resources						
<p>3.OA.B.5. Apply properties of operations as strategies to multiply and divide.² <i>Examples: If $6 \times 4 = 24$ is known, then $4 \times 6 = 24$ is also known. (Commutative property of multiplication.) $3 \times 5 \times 2$ can be found by $3 \times 5 = 15$, then $15 \times 2 = 30$, or by $5 \times 2 = 10$, then $3 \times 10 = 30$. (Associative property of multiplication.) Knowing that $8 \times 5 = 40$ and $8 \times 2 = 16$, one can find 8×7 as $8 \times (5 + 2) = (8 \times 5) + (8 \times 2) = 40 + 16 = 56$. (Distributive property.)</i></p> <p>3.OA.B.6. Understand division as an unknown-factor problem. <i>For example, find $32 \div 8$ by finding the number that makes 32 when multiplied by 8.</i></p> <p>3.OA.C.7. Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that $8 \times 5 = 40$, one knows $40 \div 5 = 8$) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.</p> <p>3.OA.D.9. Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations. <i>For example, observe that 4 times a number is always even, and explain why 4 times a number can be decomposed into two equal addends</i></p> <p>3.NBT.A.3. Multiply one-digit whole numbers by multiples of 10 in the range 10–90 (e.g., 9×80, 5×60) using strategies based on place value and properties of operations.</p> <p>3.MD.A.2. Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l).¹ Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem.</p> <p>3.MD.C.7. Relate area to the operations of multiplication and addition.</p> <ul style="list-style-type: none">a) Find the area of a rectangle with whole-number side lengths by tiling it and show that the area is the same as would be found by multiplying the side lengths.b) Multiply side lengths to find areas of rectangles with whole-number side lengths in the context of solving real world and mathematical problems and represent whole-number products as rectangular areas in mathematical reasoning.c) Use tiling to show in a concrete case that the area of a rectangle with whole-number side lengths a and $b + c$ is the sum of $a \times b$ and $a \times c$. Use area models to represent the distributive property in mathematical reasoning. <p>Recognize area as additive. Find areas of rectilinear figures by decomposing them into non-overlapping rectangles and adding the areas of the non-overlapping parts, applying this technique to solve real world problems.</p>							
<p>Lesson 9-2 Students solve number stories by multiplying and dividing with multiples of 10. Students will multiply and divide with multiples of ten to solve number stories about masses of North American birds.</p> <p>Sample question: <i>10 identical birds are sitting on a wire. They have a combined mass of 500 grams. What types of bird could they be?</i></p> <p style="text-align: center;">$500 \div 10 = 50$; $10 \times 50 = 500$</p>	<p style="text-align: center;">Multiplication/Division Diagram</p> <table><tr><th>number of birds</th><th>grams per bird</th><th>total</th></tr><tr><td>10</td><td>M</td><td>500 g</td></tr></table>	number of birds	grams per bird	total	10	M	500 g
number of birds	grams per bird	total					
10	M	500 g					

Grade 3 Unit Nine Multidigit Operations

Connections/Notes	Additional Resources
<p>3.OA.3.-1</p> <p>MCAP Evidence Statement: For assessment, this standard has been divided into two sections one for each operation.</p> <p>3.OA.A.3-1 only focuses on multiplication within 100 with both factors being less than or equal to 10 The intent of the standard is for students to solve word problem types listed in the table of Multiplication and Division Situations found in the back of this document.</p> <p>Clarifications for both multiplication and division:</p> <ul style="list-style-type: none"> • Tasks should not include a symbol for the unknown. This concept will be assessed in 3.OA.A.4 using a symbol for the unknown. • Tasks should require students to represent the context of a multiplication or division problem with a correct equation. (Answers must be given.) • Context may include word and/or an assortment of visual models using equal groups, arrays, or area models. • Must have context for a single-step word problem • If students are asked to identify the equation that matches the problem situation, a variety of equation representations should be used, such as $(5 \times 8 = 40$ or $40 = 5 \times 8$, etc.) <p>MCAP Sample Question:</p> <p>A student made 20 necklaces.</p> <ul style="list-style-type: none"> • The student put 5 beads on each necklace. • There were 10 beads in each package. <p>Which statement explains the student's correct thinking to find the total number of beads the student used to make all the necklaces?</p> <p><input type="radio"/> A. The student thinks that there are 20 necklaces and there are 10 beads in each package, and $20 \div 10 = 2$.</p> <p><input type="radio"/> B. The student thinks that there are 20 necklaces and there are 10 beads in each package, and $20 \times 10 = 200$.</p> <p><input type="radio"/> C. The student thinks that there are 20 necklaces and there are 5 beads on each necklace, and $20 \div 5 = 4$.</p> <p><input type="radio"/> D. The student thinks that there are 20 necklaces and there are 5 beads on each necklace, and $20 \times 5 = 100$.</p> <p>Lesson 9-3 Students use mental steps to multiply problems involving larger factors. This lesson has children apply the Distributive Property of Multiplication to mental computation. Although children may keep track of their thinking by recording number sentences, they are encouraged to mentally</p>	

Grade 3 Unit Nine Multidigit Operations

Connections/Notes

compute each step. This requires careful choices when decomposing a factor. For example, solving 6×15 by decomposing 15 into 10 and 5 is more likely to encourage mental reasoning than decomposing 15 into 12 and 3.

Lesson 9-5 Students partition rectangles to solve multidigit multiplication problems.

In this lesson, students sketch and partition rectangles as representations of the steps involved in breaking apart and multiplying larger numbers.

Students decompose or break apart a large factor into smaller parts to solve a multiplication problem more efficiently. Highlight strategies that demonstrate the distributive property

$$7 \times 62 =$$

$\begin{array}{c} 62 \\ \hline 60 \quad 2 \\ \hline 7 \times 60 = 420 \quad 7 \times 2 = 14 \end{array}$	$\begin{array}{c} 62 \\ \hline 30 \quad 30 \quad 2 \\ \hline 7 \times 30 = 210 \quad 7 \times 30 = 210 \quad 7 \times 2 = 14 \end{array}$
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Additional Resources

Lesson 9-4 Exploring Elapsed Time, Squares, and Bridges – Exploration Lesson

3.MD.A.1. Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram.

3.MD.A.2. Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l).¹ Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem.

3.G.A.1. Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories

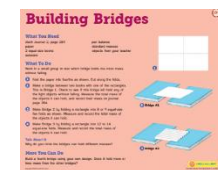
3.G.A.2. Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole. *For example, partition a shape into 4 parts with equal area, and describe the area of each part as 1/4 of the area of the shape.*

Students work with elapsed time, explore polygon relationships, and find the masses of objects.

Exploration A: Planning a Field Trip
Students plan a schedule for a class trip.

Exploration B: Taking Apart and Putting Together Squares
Students two squares into pieces and reassemble them into a single square.

Activity Cards 98-100



Grade 3 Unit Nine Multidigit Operations	
Connections/Notes	Additional Resources
Exploration C: Building Bridges Students build, test, and compare the mass that paper bridges can hold.	
Lesson 9-6 Packing Apples Two Days Open Response and Reengagement 2 Days 3.OA.C.7. Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that $8 \times 5 = 40$, one knows $40 \div 5 = 8$) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers. 3.NBT.A.2. Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.	
Lesson 9-6 Open Response and Re-engagement Lesson Day 1: Students develop strategies for using a calculator with a broken division key to solve a problem. Day 2: Students compare and discuss their strategies and revise their work.	
Lesson 9-7 The Length-of-Day Project, Revisited (Optional Lesson) 3.MD.A.1. Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram. 3.MD.B.3. Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step “how many more” and “how many less” problems using information presented in scaled bar graphs. <i>For example, draw a bar graph in which each square in the bar graph might represent 5 pets.</i>	
Lesson 9-8 Unit 9 Assessment	Math GR 3 Unit 9 Summative Assessment in eDoctrina