Mathematics Curriculum

Comprehensive Curriculum Guide

Grade 3 General Reveal

Term 1

2025-2026

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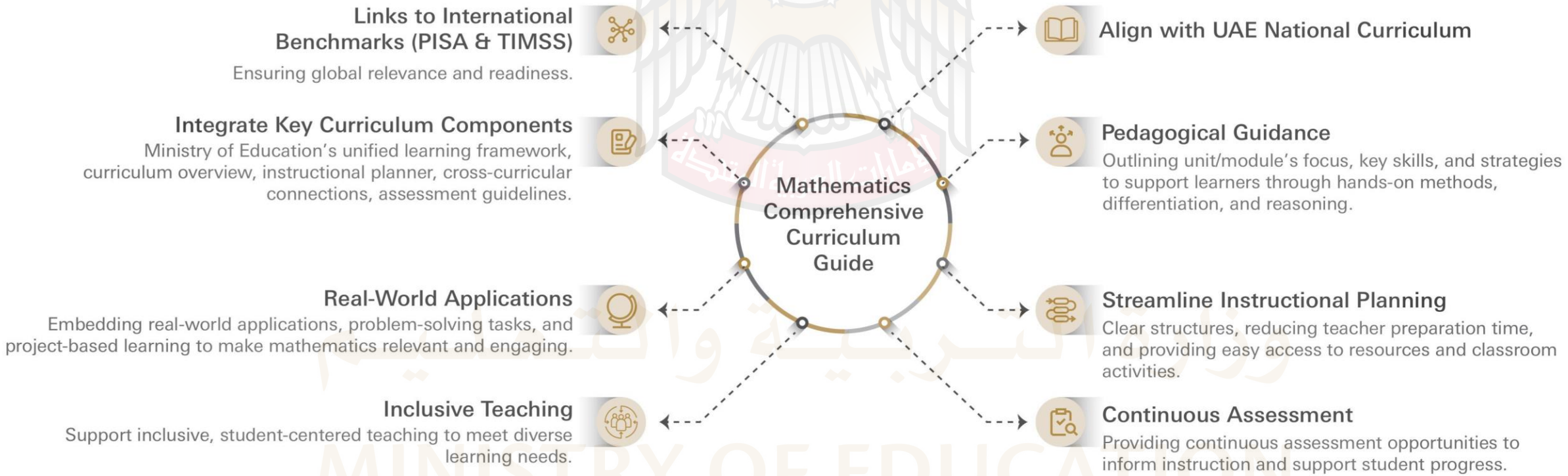
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CCG Overview

The Mathematics Comprehensive Curriculum Guide (CCG) serves as a robust, unified framework designed to support educators in delivering high-quality, coherent, and standards-aligned mathematics instruction. This guide combines all essential components into one accessible and organized resource to ensure consistency, efficiency, and clarity in the classroom.



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1 Promotes meaningful understanding over rote memorization.

Conceptual Understanding

2 Empowers students to take ownership of their learning.

Student Empowerment

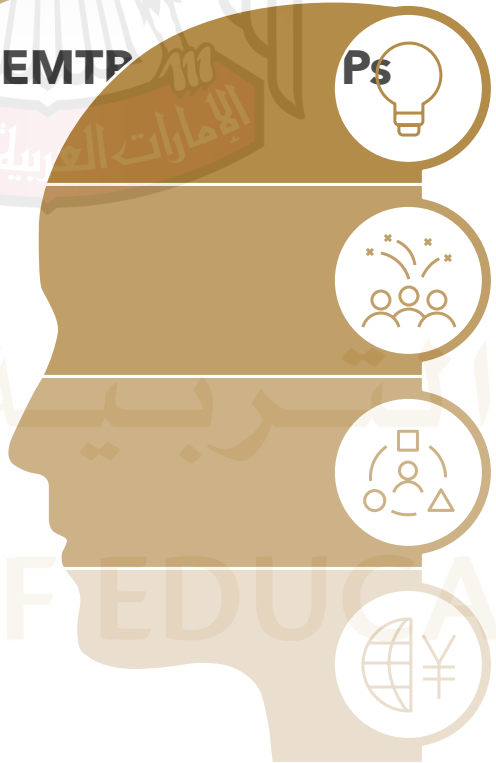
3 Ensures inclusive and culturally responsive mathematics education.

Equity and Access

EMTPs Enhance Quality Teaching Practice

of EMTP Ps

SMPs Enhance Students' Learning Expertise



Conceptual Understanding

Promotes deeper understanding of math concepts

Critical Thinking

Encourages students to analyze and evaluate

Collaboration

Fosters teamwork and communication skills

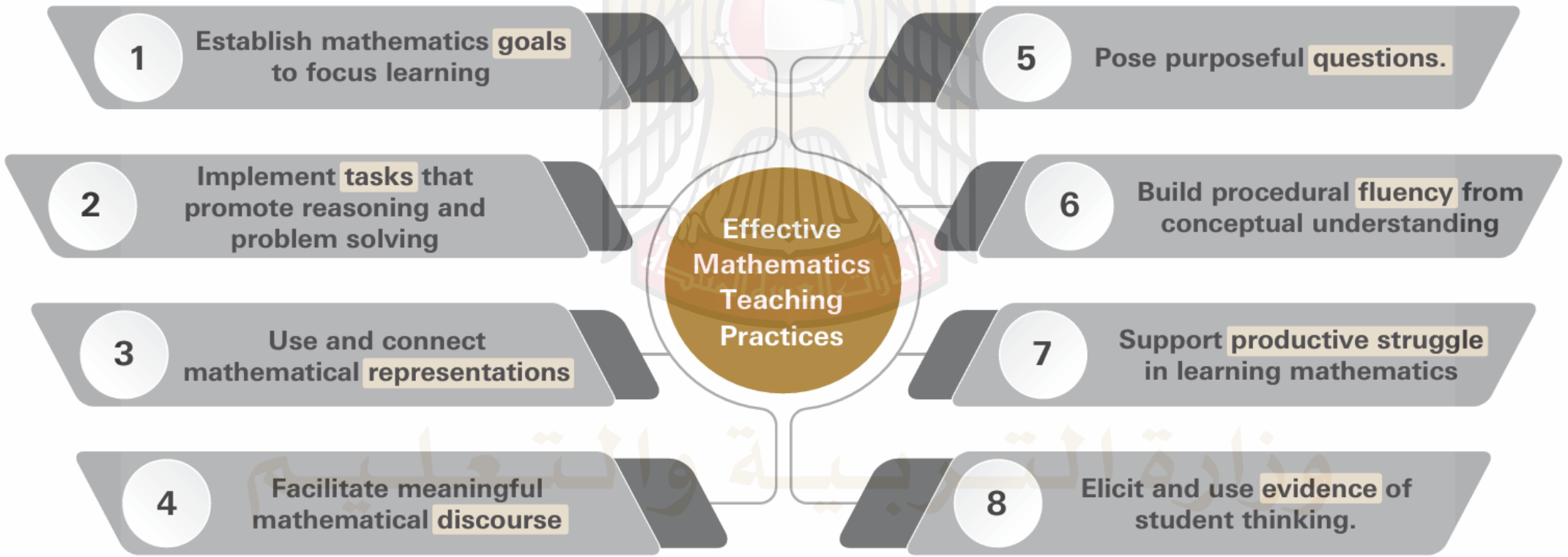
Real-World Application

Connects math to practical scenarios

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Integrating Mathematical Teaching Practices and Standards for Mathematical Practice for Effective Instruction



The National Council of Teachers of Mathematics (2015). Principles to actions: Ensuring mathematical sucess for all.

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Standards for Student Mathematical Practices (with examples)

1	**Make sense of problems & persevere in solving them**		example: Identify patterns in a complex word problem, breaks it down into manageable parts, and persists in finding a solution.
2	**Choose Reason abstractly & quantitatively**		example: Apply proportional reasoning to plan for a budget for a school event considering different quantities and their proportional relationships.
3	**Construct viable arguments & critique the reasoning of others**		example: Build a logical progression of statements to prove a mathematical theorem and evaluates the credibility of another students' solution by identifying flaws in their reasoning.
4	**Model with mathematics**		example: Use geometry to design a garden layout considering the spatial relationships between plants and pathways
5	**Use appropriate tools strategically**		example: Analyse data using spreadsheet and graphs to draw conclusions.
6	**Attend to precision**		example: Provide clear explanations of mathematical concepts, correctly labels diagrams, and expresses numerical answers with the appropriate level of precision.
7	**Look for & make use of structure**		example: Identify the distributive property in an algebraic expression and uses it to simplify complex equations.
8	**Look for & express regularity in repeated reasoning**		example: Observe patterns in repeated steps and find efficient solutions based on regular patterns.

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Continuous Assessment

Assessment Information

There should be evidence demonstrating a competent understanding of assessment information - this is cited within CCG Scheme of work/Lesson Plan:

- The lesson plan includes the **current assessment information** of the students
- The lesson plan includes the **ability ranges** of the students based on assessment information
- The lesson plan includes some (not all) **targeted students**
- The lesson plan includes information about **strengths and weaknesses** of the students
- The lesson plan includes the **challenges and support** required for students

Effective Formative Assessment

Teachers carry out effective formative assessments as part of their teaching. They **ask questions, mark learners' work**, observe their students in the process of learning and **give effective feedback**. They **ensure clear opportunities for peer/self-assessment**.

Teachers demonstrate a **high level of formative assessment**: Assessing **knowledge, skills and understanding** - evidenced by using **a large variety of action verbs** for example:

What am I assessing	Verbs to begin questions
Knowledge	State, Name, List, Describe, Label, Write, Recall
Understanding	Explain, Compare, Contrast, Outline
Skills	Construct, Perform, Predict, Investigate, Interpret, Carry out

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Continuous Assessment

Assessing Knowledge, skills and understanding

- Knowledge is the easiest to assess because it is straightforward to find out whether or not a student has retained some information: a simple question can usually find this out. We ask them to name something or state something or label a diagram.
- Assessing deeper understanding is much more difficult, so we usually ask learners to outline, explain or compare a process. This will give us some idea of the extent of their understanding.
- Skills are the ability to perform, so we will always be looking for some action on the part of the student – Are they able to do something? Can they demonstrate practical abilities?

Action Verbs			
Apply	Define	Draw	List/Name
Calculate	Demonstrate	Explain	Motivate
Classify	Derive	Formulate	Organize
Compare	Describe	Identify	Predict
Contrast	Differentiate	Illustrate	Relate
Convert	Discuss	Interpret	Solve
Criticize/Evaluate	Distinguish	Justify	Summarize

Whether we are assessing knowledge, understanding or skills affects the language we are using, particularly the verbs we choose.

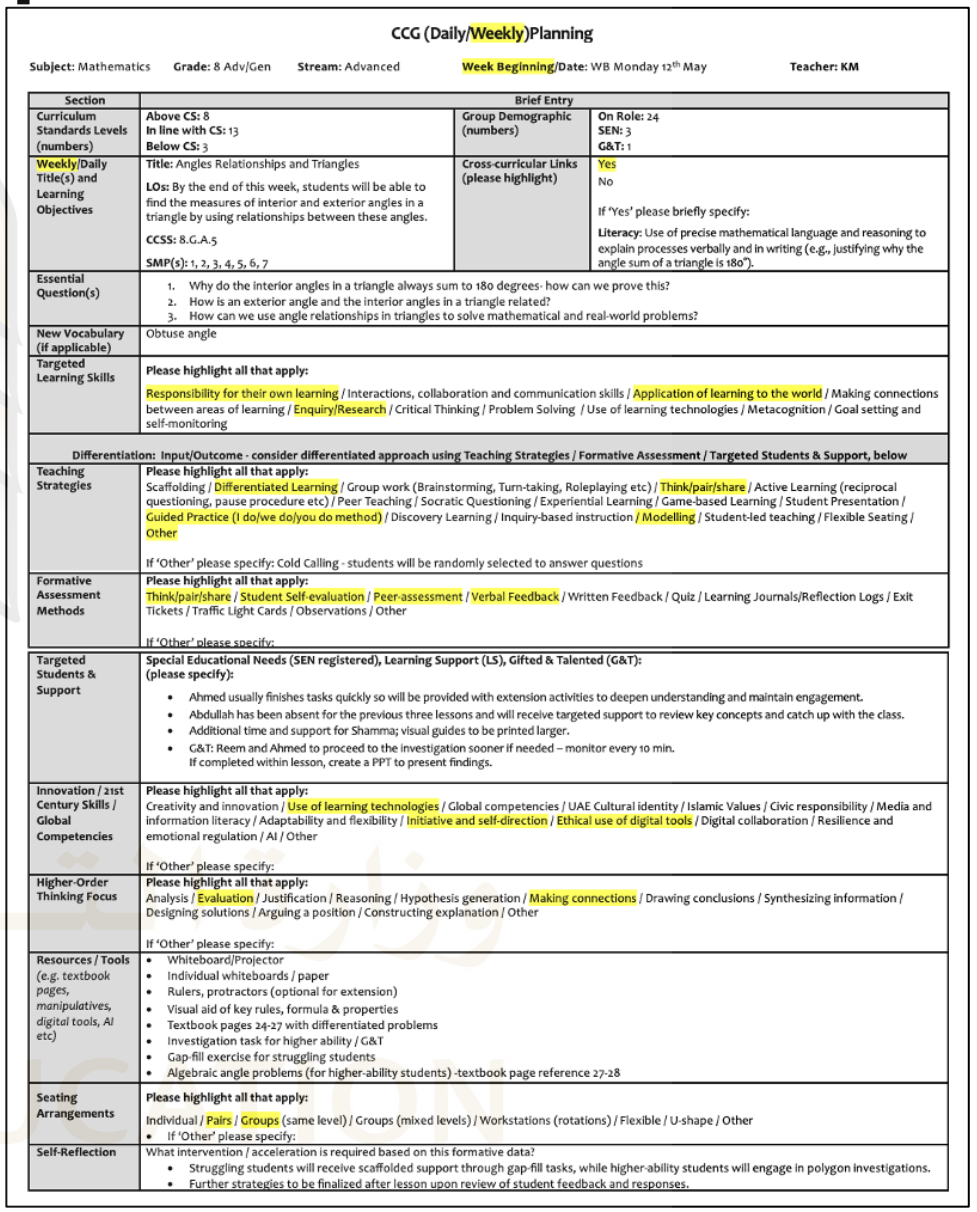
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Lesson Plan Exemplar

This comprehensive lesson plan template structures daily and weekly teaching around learning objectives, instructional strategies, and targeted support, ensuring alignment with the CCGs and the UAE Inspection Framework for effective and inclusive instruction.

This table outlines the lesson plan sections and shows whether they require self-completion or selection from provided options.

Section	Completion
Curriculum Levels (numbers)	Self-completion
Group Demographic (numbers)	Self-completion
Weekly/Daily Title(s) and Learning Objectives	Self-completion
Cross-curricular Links (if applicable)	Self-completion
Essential Question(s)	Self-completion
New Vocabulary (if applicable)	Self-completion
Targeted Learning Skills	Selection
Teaching Strategies	Selection
Formative Assessment Methods	Selection
Targeted Students & Support	Self-completion
Innovation / 21st Century Skills / Global Competencies	Selection
Higher-Order Thinking Focus	Selection
Resources / Tools	Self-completion
Seating Arrangements	Selection
Self-Reflection	Self-completion



CCG (Daily/Weekly)Planning

Subject: Mathematics **Grade:** 8 Adv/Gen **Stream:** Advanced **Week Beginning/Date:** WB Monday 12th May **Teacher: KM**

Section	Brief Entry		
Curriculum Standards Levels (numbers)	**Above CS:** 8 **In line with CS:** 13 **Below CS:** 3	Group Demographic (numbers)	**On Role:** 24 **SEN:** 3 **G&T:** 1
Weekly/Daily Title(s) and Learning Objectives	**Title:** Angles Relationships and Triangles **LOs:** By the end of this week, students will be able to find the measures of interior and exterior angles in a triangle by using relationships between these angles. **CCSS:** 8.G.A.5 **SMP(s):** 1, 2, 3, 4, 5, 6, 7	Cross-curricular Links (please highlight)	Yes No If 'Yes' please briefly specify: **Literacy:** Use of precise mathematical language and reasoning to explain processes verbally and in writing (e.g., justifying why the angle sum of a triangle is 180°).
Essential Question(s)	1. Why do the interior angles in a triangle always sum to 180 degrees- how can we prove this? 2. How is an exterior angle and the interior angles in a triangle related? 3. How can we use angle relationships in triangles to solve mathematical and real-world problems?		
New Vocabulary (if applicable)	Obtuse angle		
Targeted Learning Skills	**Please highlight all that apply:** Responsibility for their own learning / Interactions, collaboration and communication skills / Application of learning to the world / Making connections between areas of learning / Enquiry/Research / Critical Thinking / Problem Solving / Use of learning technologies / Metacognition / Goal setting and self-monitoring		
Differentiation: Input/Outcome - consider differentiated approach using Teaching Strategies / Formative Assessment / Targeted Students & Support, below			
Teaching Strategies	**Please highlight all that apply:** Scaffolding / Differentiated Learning / Group work (Brainstorming, Turn-taking, Roleplaying etc) / Think/pair/share / Active Learning (reciprocal questioning, pause procedure etc) / Peer Teaching / Socratic Questioning / Experiential Learning / Game-based Learning / Student Presentation / Guided Practice (I do/we do/you do method) / Discovery Learning / Inquiry-based instruction / Modelling / Student-led teaching / Flexible Seating / Other If 'Other' please specify: Cold Calling - students will be randomly selected to answer questions		
Formative Assessment Methods	**Please highlight all that apply:** Think/pair/share / Student Self-evaluation / Peer-assessment / Verbal Feedback / Written Feedback / Quiz / Learning Journals/Reflection Logs / Exit Tickets / Traffic Light Cards / Observations / Other If 'Other' please specify:		
Targeted Students & Support	**Special Educational Needs (SEN registered), Learning Support (LS), Gifted & Talented (G&T): (please specify):** • Ahmed usually finishes tasks quickly so will be provided with extension activities to deepen understanding and maintain engagement. • Abdullah has been absent for the previous three lessons and will receive targeted support to review key concepts and catch up with the class. • Additional time and support for Shamma; visual guides to be printed larger. • G&T: Reem and Ahmed to proceed to the investigation sooner if needed – monitor every 10 min. If completed within lesson, create a PPT to present findings.		
Innovation / 21st Century Skills / Global Competencies	**Please highlight all that apply:** Creativity and innovation / Use of learning technologies / Global competencies / UAE Cultural identity / Islamic Values / Civic responsibility / Media and information literacy / Adaptability and flexibility / Initiative and self-direction / Ethical use of digital tools / Digital collaboration / Resilience and emotional regulation / AI / Other If 'Other' please specify:		
Higher-Order Thinking Focus	**Please highlight all that apply:** Analysis / Evaluation / Justification / Reasoning / Hypothesis generation / Making connections / Drawing conclusions / Synthesizing information / Designing solutions / Arguing a position / Constructing explanation / Other If 'Other' please specify:		
Resources / Tools *(e.g. textbook pages, manipulatives, digital tools, AI etc)*	• Whiteboard/Projector • Individual whiteboards / paper • Rulers, protractors (optional for extension) • Visual aid of key rules, formula & properties • Textbook pages 24-27 with differentiated problems • Investigation task for higher ability / G&T • Gap-fill exercise for struggling students • Algebraic angle problems (for higher-ability students) -textbook page reference 27-28		
Seating Arrangements	**Please highlight all that apply:** Individual / Pairs / Groups (same level) / Groups (mixed levels) / Workstations (rotations) / Flexible / U-shape / Other • If 'Other' please specify:		
Self-Reflection	What intervention / acceleration is required based on this formative data? • Struggling students will receive scaffolded support through gap-fill tasks, while higher-ability students will engage in polygon investigations. • Further strategies to be finalized after lesson upon review of student feedback and responses.		

Lesson Plan Exemplar

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Lesson Plan Template

Using the Lesson Planning Tool Effectively

- Complete daily or weekly for each lesson or set of lessons.
- Align with the appropriate Comprehensive Curriculum Guide (CCG).
- Covers all key components required for effective planning and is aligned with the UAE Inspection Framework.
- Helps structure lessons around clearly defined objectives, strategies, and outcomes.
- Acts as a professional learning tool, helping teachers identify effective strategies they may not have used before.
- Supports consistency in teaching and planning across classrooms and departments.
- Supports differentiation and inclusion in the classroom.
- Encourages reflection and continual improvement.

Daily/Weekly Planning

Subject: **Grade/Class:** **Stream:** **Week Beginning/Date:** **Teacher:**

Section	Brief Entry		
Curriculum Standards Levels (numbers)	Above CS: In line with CS: Below CS:	Group Demographic (numbers)	On Role: SEN: G&T:
Weekly/Daily Title(s) and Learning Objectives	Title: LOs:	Cross-curricular Links (please highlight)	Yes No If 'Yes' please briefly specify:
Essential Question(s)			
New Vocabulary (if applicable)			
Targeted Learning Skills	**Please highlight all that apply:** Responsibility for their own learning / Interactions, collaboration and communication skills / Application of learning to the world / Making connections between areas of learning / Enquiry/Research / Critical Thinking / Problem Solving / Use of learning technologies / Metacognition / Goal setting and self-monitoring		
Differentiation: Input/Outcome - consider differentiated approach using Teaching Strategies / Formative Assessment / Targeted Students & Support, below			
Teaching Strategies	**Please highlight all that apply:** Scaffolding / Differentiated Learning / Group work (Brainstorming, Turn-taking, Roleplaying etc) / Think/pair/share / Active Learning (reciprocal questioning, pause procedure etc) / Peer Teaching / Socratic Questioning / Experiential Learning / Game-based Learning / Student Presentation / Guided Practice (I do/we do/you do method) / Discovery Learning / Inquiry-based instruction / Modelling / Student-led teaching / Flexible Seating / Other If 'Other' please specify:		
Formative Assessment Methods	**Please highlight all that apply:** Think/pair/share / Student Self-evaluation / Peer-assessment / Verbal Feedback / Written Feedback / Quiz / Learning Journals/Reflection Logs / Exit Tickets / Traffic Light Cards / Observations / Other If 'Other' please specify:		
Targeted Students & Support	**Special Educational Needs (SEN registered), Learning Support (LS), Gifted & Talented (G&T)** **(please specify):**		
Innovation / 21st Century Skills / Global Competencies	**Please highlight all that apply:** Creativity and innovation / Use of learning technologies / Global competencies / UAE Cultural identity / Islamic values / Civic responsibility / Media and information literacy / Adaptability and flexibility / Initiative and self-direction / Ethical use of digital tools / Digital collaboration / Resilience and emotional regulation / AI / Other If 'Other' please specify:		
Higher-Order Thinking Focus	**Please highlight all that apply:** Analysis / Evaluation / Justification / Reasoning / Hypothesis generation / Making connections / Drawing conclusions / Synthesizing information / Designing solutions / Arguing a position / Constructing explanation / Other If 'Other' please specify:		
Resources / Tools *(e.g. textbook pages, manipulatives, digital tools, etc)*			
Seating Arrangements	**Please highlight all that apply:** Individual / Pairs / Groups (same level) / Groups (mixed levels) / Workstations (rotations) / Flexible / U-shape / Other If 'Other' please specify:		
Self-Reflection	**Prompts** • How has formative data from previous lesson(s) informed this lesson • How will formative data from this lesson guide and inform your planning for the next lesson(s)? • What intervention / acceleration is required based on this formative data?		

Lesson Plan Template

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Learning Progression Tracker – Excel File

The Learning Progression Tracker (LPT) is an Excel tool that supports the successful implementation of **CCG** goals by helping teachers track attendance, mastery, and student progress in a clear, organized way.

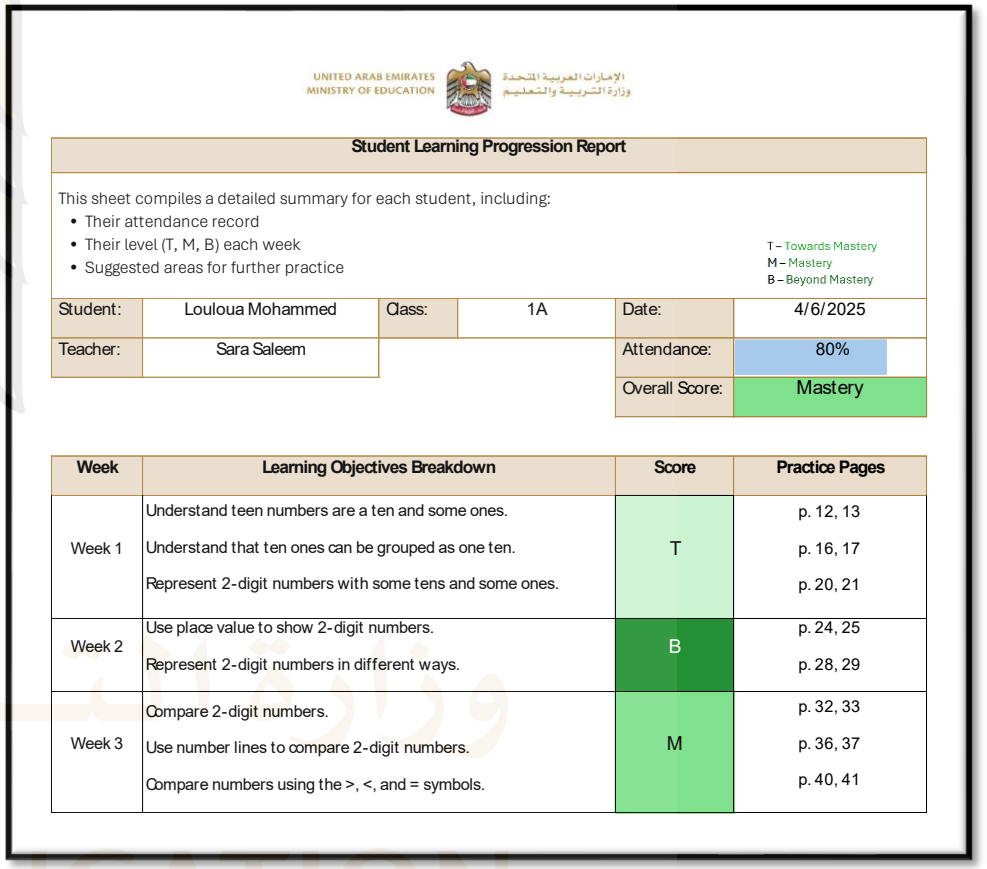
The tool is built around **four** core components:

1. **Attendance Tracker**
   Records student attendance and calculates weekly percentages.

2. **Learning Progression Tracker**
   Tracks student mastery of weekly learning objectives.

3. **Tracker Analysis**
   Summarizes class performance using charts and tables

4. **Student LP Report**
   Generates individual student reports for review or sharing.



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Student Learning Progression Report

This sheet compiles a detailed summary for each student, including:
- Their attendance record
- Their level (T, M, B) each week
- Suggested areas for further practice

T – Towards Mastery
M – Mastery
B – Beyond Mastery

Student:	Louloua Mohammed	Class:	1A	Date:	4/6/2025
Teacher:	Sara Saleem			Attendance:	80%
				Overall Score:	Mastery

Week	Learning Objectives Breakdown	Score	Practice Pages
Week 1	Understand teen numbers are a ten and some ones. Understand that ten ones can be grouped as one ten. Represent 2-digit numbers with some tens and some ones.	T	p. 12, 13 p. 16, 17 p. 20, 21
Week 2	Use place value to show 2-digit numbers. Represent 2-digit numbers in different ways.	B	p. 24, 25 p. 28, 29
Week 3	Compare 2-digit numbers. Use number lines to compare 2-digit numbers. Compare numbers using the >, <, and = symbols.	M	p. 32, 33 p. 36, 37 p. 40, 41

For a detailed walkthrough of how to use the tracker, refer to the full user guide.

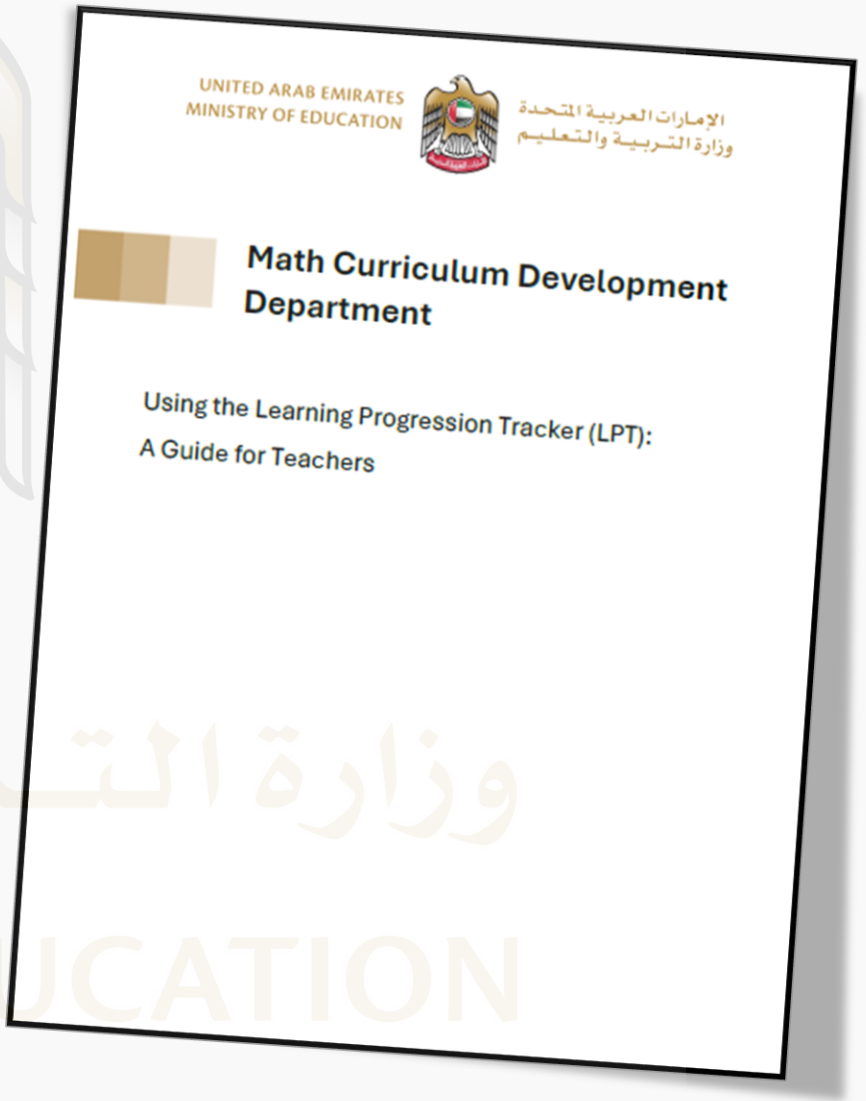
Learning Progression Tracker

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Learning Progression Tracker – User Guide

A brief guide to help teachers use the tracker effectively

Available on the LMS or access it instantly by accessing this link.





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Teaching & Learning Resources

Grade 3 General Stream Mathematics

Digital Platforms

Reveal MATH

matific

Khan Academy

IXL LEARNING

Education.com

twinkl

Common Core State Standards

White Rose MATHS

desmos classroom

Sheppard Software

Mathigon

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Grade 3 General Mathematics
Scheme of Work, Academic Year 2025-2026

Key Mathematical Understandings

By the end of Grade 3, students will be able to:

Operations & Algebraic Thinking (Domain 3.OA)	***Number and Operations in Base Ten Number and Operations–Fractions (Domain 3.NBT)***	***Geometry (Domain 3.G)***	***Measurement & Data (Domain 3.MD)***
▪ 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.	▪ Use place value understanding and properties of operations to perform multi-digit arithmetic. ▪ Develop understanding of fractions as numbers	▪ Reason with shapes and their attributes.	▪ Solve 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

Resources:

Grade 3 Reveal Math Course 1, Teacher Edition e-Book, Volume 1
Grade 3 Reveal Math Course 1, Student Edition e-Book, Volume 1
Scope & Sequence & Instructional Planners (IPs) – LMS Platform
Digital Platforms – Reveal, Matific & Mathematical Literacy Resources – LMS Platform

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Term 1 Overview
Grade 3 General Stream Mathematics

Unit 1 – Math is Mine	
Page	Topic
18	Overviews & Instructional Ideas

Unit 2 – Use Place Value to Fluently Add and Subtract within 1,000	
Page	Topic
22	Represent 4-Digit Numbers
24	Round Multi-Digit Numbers
26	Estimate Sums and Differences
28	Use Addition Properties to Add
30	Addition Patterns
32	Use Partial Sums to Add
34	Decompose to Subtract
36	Adjust Numbers to Add or Subtract
38	Use Addition to Subtract
40	Fluently Add within 1,000
42	Fluently Subtract within 1,000
44	Solve Two-Step Problems Involving Addition and Subtraction

Unit 3 – Multiplication and Division	
Page	Topic
78	Understand Equal Groups
80	Use Arrays to Multiply
82	Understand the Commutative Property
84	Understand Equal Sharing
86	Understand Equal Grouping
88	Relate Multiplication and Division
90	Find the Unknown

Remarks
• **Page numbers** refer to those in the document. • **Weekly pacing** is a guideline and may be adjusted at the teacher's discretion. • **Scope & Sequence** and **Instructional Planners** are available on the LMS.

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Term 1 Overview
Grade 3 General Stream Mathematics

Unit 4 – Use Patterns to Multiply by 0, 1, 2, 5, and 10	
Page	Topic
64	Use Patterns to Multiply by 2
66	Use Patterns to Multiply by 5
68	Use Patterns to Multiply by 10
70	Use Patterns to Multiply by 1 and 0
72	Multiply Fluently by 0, 1, 2, 5, and 10
74	Solve Problems Involving Equal Groups

Unit 5-Use Properties to Multiply by 3, 4, 6, 7, 8, and 9	
Page	Topic
71	Understand the Distributive Property
73	Use Properties to Multiply by 3
75	Use Properties to Multiply by 4
77	Use Properties to Multiply by 6
79	Use Properties to Multiply by 8
81	Use Properties to Multiply by 7 and 9
83	Solve Problems Using Arrays

Remarks
• **Page numbers** refer to those in the document. • **Weekly pacing** is a guideline and may be adjusted at the teacher's discretion. • **Scope & Sequence** and **Instructional Planners** are available on the LMS.

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Math is Mine

Notes & Guidance

Unit 1 aims to help students build a strong identity as *doers and thinkers of mathematics*. Rather than viewing math as just solving problems and performing operations, students will begin to see mathematics as a way of thinking, reasoning, and exploring the world around them. This unit focuses on three core goals:

- **Building Student Autonomy**
  Empower students to take ownership of their thinking and learning in math.
- **Developing a Growth-Oriented Mathematical Mindset**
  Support students in viewing mistakes and challenges as essential parts of learning.
- **Creating a Productive Math Environment**
  Establish class norms and routines that support collaboration, risk-taking, and mathematical discourse.

This unit is designed as a foundational week to be embedded and reinforced throughout the year. You are encouraged to adapt or supplement textbook materials to best meet your students' needs. The focus is not on covering content but on setting up a classroom culture that fosters curiosity, collaboration, and problem solving.

Pedagogy

- **Establish Warm and Engaging Math Routines**
  Create consistent math routines that build community with energy and fun.
- **Set and Co-Create Class Norms**
  Involve students in shaping the classroom math culture.
- **Decorate your classroom**
  Design the classroom environment to support learning and spark curiosity – "*Word of the Day Wall*" or "*Math Identity Wall*".
- **Play Logic & Puzzle Game**
  Use logic and reasoning games to spark joy and build mathematical thinking.

Key Skills & Learning Goals

- Make sense of a problem
- Use math to model a problem
- Reason about quantities
- Explain their thinking and respond to their classmates' thinking
- Choose appropriate tools
- Be precise
- Notice patterns and make generalizations
- Review math learned previously - link

International Assessment Links

Cognitive Domains

The three TIMSS cognitive domains – **Knowing**, **Applying**, and **Reasoning** –represent a progression of mathematical thinking: from recalling facts and procedures, to using knowledge in real-world and abstract problem-solving situations, to demonstrating logical thinking, justification, and generalization.

Mathematical Reasoning

Mathematical reasoning is the process of using logical thinking to **formulate** problems mathematically, **employ** appropriate concepts and procedures to solve them, and **interpret and apply** the results in real-world contexts.

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Math is Mine – Instructional Ideas

Establish Warm and Engaging Math Routines

Create consistent math routines that build community and signal transitions with energy and fun. Use call-and-response or movement-based cues like:

- *"1-2-3, eyes on me!"*
- *"Waterfall"* (students reply: *woooosh!*)
- *"Mac and cheese–everybody freeze!"*



Set & Co-Create Class Norms



Involve students in shaping the classroom math culture:

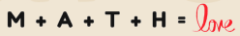
- **Discuss**: "What helps us think and learn in math?"
- **Brainstorm**: "What makes a great math partner?"
- Collaboratively write and sign a classroom math agreement

Play Logic Games & Puzzles

Use logic and reasoning games to spark joy and build mathematical thinking. Suggestions:

- *Sprouts* (strategy game with dots and lines)
- *Guess My Number*
- *Don't Break the Chain*
- *Weekly Math riddles*





Decorate Your Classroom

Design the classroom environment to support learning and spark curiosity:

- Number lines that wrap around the room
- A "Growing" Math Word Wall (updated weekly)
- A Puzzle-of-the-Week bulletin board



Create a Math Wall



Dedicate a space in the room where students can reflect on and express their feelings about math. Include:

- *"What math means to me"* thought bubbles
- *"I am a…"* math strength posters (e.g., *"I'm a pattern spotter!"*)
- Drawings about how math makes them feel

Math Read Alouds

Read engaging, math-themed picture books aloud to inspire thinking and discussion. *Suggestions*:





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Place Value to 1,000

Notes & Guidance

In this unit students extend their knowledge of place value to 3- and 4-digit numbers and apply this to adding and subtracting 3-digit numbers. They use place value strategies, rounding, and compatible numbers to estimate sums and differences. Students deepen their understanding of addition properties by learning that the order or grouping of addends does not change the sum. They also explore even and odd addition patterns for checking accuracy. Additionally, students use their understanding of place value strategies to solve two-step word problems.

Game Station Book Is available in Reveal Platform and will be attached to the CCG File

Key Skills & Learning Goals

- Represent 3- and 4-digit numbers using standard form, expanded form, and word form.
- Round multi-digit numbers to the nearest 10 and nearest 100 to support estimation
- Apply properties of addition (such as associative and commutative properties) to simplify problems.
- Use decomposition and other strategies to subtract multi-digit numbers.
- Solve and explain two-step word problems involving addition and subtraction.

Pedagogy

- **Concrete–Pictorial–Abstract (CPA)**
- **Math Games and Play-Based Learning**
- **Visual Aids and Anchor Charts**
- **Interactive Math Centers**
- **Questioning and Mathematical Discourse**

Overall Focus

- Encourage **strategic flexibility** rather than rote memorization.
- Prioritize **conceptual understanding** over procedural fluency initially.
- Promote **student discourse** and **justification of reasoning**.

International Assessment Links

IEA TIMSS

Understanding the Value of Digits Based on Place

Focus: Applying in number value interpretation Students demonstrate the ability to apply their understanding of digit values (e.g., knowing that the 7 in 371 equals 70), often using base-10 blocks or mental math..

PISA

Reading and Writing Numbers to 1,000

Focus: Interpreting representations in quantity Students interpret and use multi-digit numbers in real-life contexts such as prices, distances, or digital displays, requiring accurate reading and understanding of number structure.

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Unit 2 – Use Place Value to Fluently Add and Subtract within 1,000
Learning Objectives & Criteria

Unit Goal:

Use place value to add and subtract 3-digit numbers.
Use place value to form estimations for sum and difference by rounding and using compatible numbers.

Learning Objective (LO)	Common Core State Standard	Formative Assessment Criteria
• Represent 4-digit numbers in expanded form, word form, and standard form using an understanding of place value.	◆ 3.NBT.A.1 Use place value understanding to round whole numbers to the nearest 10 or 100.	• Can you write this 4-digit number (e.g., 3,482) in expanded form and word form ? • What does the digit 4 represent in the number 3,482?
• Round numbers to the nearest 10 or nearest 100.		• If a number ends in 5, do we round up or down? Why?
• Use compatible numbers to estimate a sum or difference.		• What are two compatible numbers you could use to estimate the sum of 198 + 407? Why did you choose them?.
• Apply the properties of addition when adding two or more addends.	◆ 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.	• If you group 4 + (6 + 5) or (4 + 6) + 5, will the total change? Explain. • Can you show two different ways to add 6 + 8 + 4 using grouping or reordering? Do both give the same result?
• Identify addition patterns and use the patterns to help determine sums of 3-digit numbers and check their accuracy.	◆ 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..	• What pattern do you notice when you add 100 + 200 + 300? Can you explain it? • If you see that 246 + 135 = 381, how could you use the pattern to solve 346 + 135 quickly? • How can doubling help you add 223 + 223 quickly? What other addition problems follow this pattern?
• Use partial sums to add 3-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.	• Can you show how to break apart 348 + 267 using partial sums? What do you get when you add the hundreds, tens, and ones separately? • Is it possible to use partial sums to add 312 + 408? Can you walk me through the steps you would take?

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Unit 2 – Use Place Value to Fluently Add and Subtract within 1,000
Learning Objectives & Criteria

Unit Goal:

Use place value to add and subtract 3-digit numbers.
Use place value to form estimations for sum and difference by rounding and using compatible numbers.

Learning Objective (LO)	Common Core State Standard	Formative Assessment Criteria
• Decompose one number in different ways to subtract.	◆ 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.	• How can you break apart the number 452 to help you subtract 278 more easily?
• Adjust numbers to help add or subtract.		• Can you show how to subtract 198 from 462 by adjusting the numbers?
• Use related addition equations to find the difference.		• If the equation is 82 – 47 = ?, what addition equation can you use to help find the difference?
• Explain different strategies to add 3-digit numbers.		• What strategy would you use to solve 346 + 278? Can you explain why?
• Explain different strategies to subtract 3-digit numbers.		• What strategy would you use to solve 642 − 318? Can you explain why?
• Write and solve equations to represent a two-step problem. • Use letters for unknowns.	◆ 3.OA.D.9 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	• What are the two operations needed to solve this problem: "Sarah has 25 apples. She buys 15 more and then gives 12 to her friend"?. • If you don't know a number in a math sentence, how can you show it using a letter? • What letter could you use to represent an unknown number in this equation: 5 + ___ = 12?

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2-1 Represent 4-Digit Numbers

Learning Objectives
Students should be able to: Represent 4-digit numbers in expanded form, word form, and standard form using an understanding of place value.

Towards Mastery	Mastery	Beyond Mastery
• **Students represent 4-digit numbers in place value chart (standard form).** **Student activity:** "Number Builder Battle" **Materials Needed:** A deck of playing cards (remove all face cards). Use only cards numbered **1 through 10** (with **10 representing 0**).  **Instructions:** Each student draws **4 cards** from the deck. They arrange the cards to create a **4-digit number**. Students then represent this number in **three different ways**: Using **base-ten blocks** On a **place-value chart** On a **number line** **Discussion:** Talk with students about the **similarities and differences** among the three representations. Emphasize how to properly deal with **zeros in place-value positions**.	• **Students represent 4-digit numbers in word form and expanded form.** **Student activity:** Represent It Task Cards **Materials Needed:** Four number cubes (dice) numbered **1–6**  **Instructions:** Roll **three number cubes** to play **"Represent It! Hundreds."** Roll **four number cubes** to play **"Represent It! Thousands."** Use the digits rolled to create a number. Represent the number in the following ways: In a **place-value chart** In **word form** Using **base-ten blocks** In **expanded form** • **All Materials are available in Game station Book on Reveal Platform Page 1 to 3**	• **Students accurately and fluently switch between all three forms of representation.** **Student activity:** "Mystery Number Challenge" **Materials Needed:** Index cards **Instructions:**  **Give students the following clues** to figure out the 4-digit number: The number is **even**. The **digit in the thousands place** is **twice** the digit in the hundreds place. The **sum of all the digits** is **18**. The **digit in the tens place** is **greater than the ones place**. All digits are **different**. After students find the mystery number, ask them to explain how to represent it in these ways: **Place-Value Chart** **Word Form** **Expanded Form** **Base-Ten Blocks** **Standard Form** 

Domain
Number and Operations in Base Ten

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

SMPs
MPs 7, 8

Key Vocabulary
Expanded Form
Standard Form
Word Form

Basic Numeracy Skills

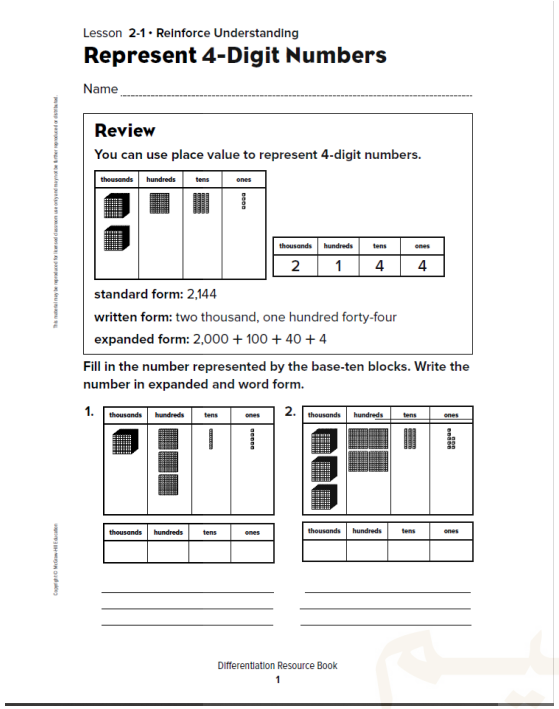
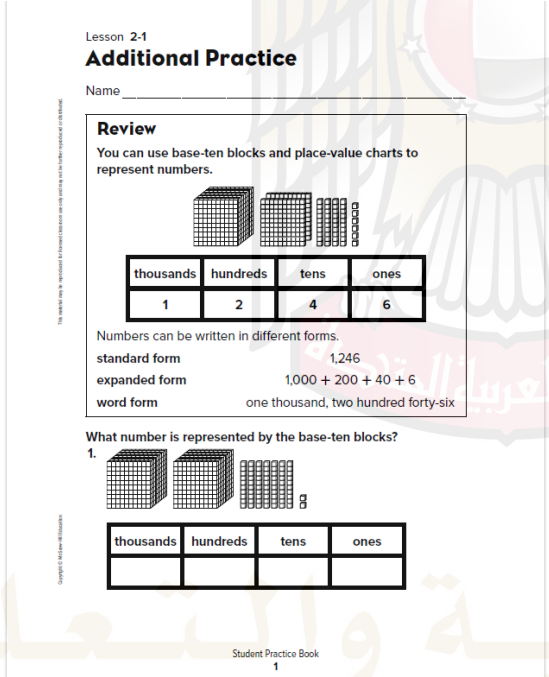
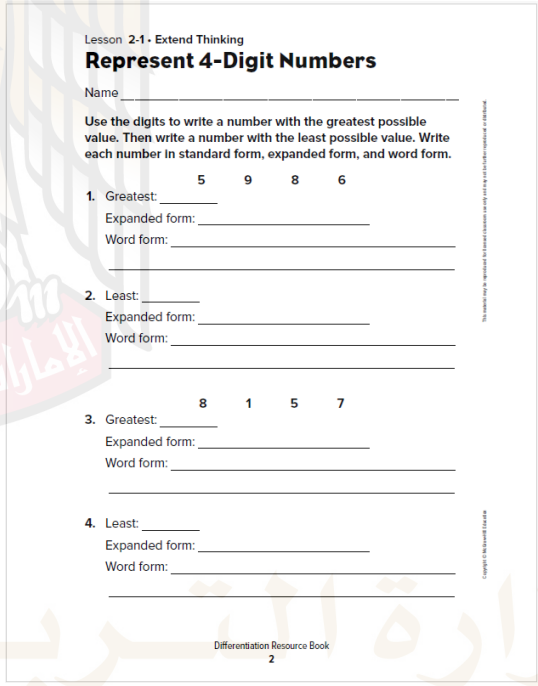
- ☐ Counting On
- ☐ Place Value
- ☐ Addition

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2-1 Represent 4-Digit Numbers

Learning Objectives

Students should be able to: Represent 4-digit numbers in expanded form, word form, and standard form using an understanding of place value.

Towards Mastery	Mastery	Beyond Mastery
		

Lesson 2-1 • Reinforce Understanding

Represent 4-Digit Numbers

Name _____

Review

You can use place value to represent 4-digit numbers.

thousands	hundreds	tens	ones
2	1	4	4

standard form: 2,144

written form: two thousand, one hundred forty-four

expanded form: 2,000 + 100 + 40 + 4

Fill in the number represented by the base-ten blocks. Write the number in expanded and word form.

1. 2.

Differentiation Resource Book 1

Lesson 2-1

Additional Practice

Name _____

Review

You can use base-ten blocks and place-value charts to represent numbers.

thousands	hundreds	tens	ones
1	2	4	6

Numbers can be written in different forms.

standard form	1,246
expanded form	1,000 + 200 + 40 + 6
word form	one thousand, two hundred forty-six

What number is represented by the base-ten blocks?

1.

thousands	hundreds	tens	ones

Student Practice Book 1

Lesson 2-1 • Extend Thinking

Represent 4-Digit Numbers

Name _____

Use the digits to write a number with the greatest possible value. Then write a number with the least possible value. Write each number in standard form, expanded form, and word form.

5 9 8 6

1. Greatest: _____
   Expanded form: _____
   Word form: _____
   Least: _____
   Expanded form: _____
   Word form: _____

2. Least: _____
   Expanded form: _____
   Word form: _____
   Greatest: _____
   Expanded form: _____
   Word form: _____

8 1 5 7

3. Greatest: _____
   Expanded form: _____
   Word form: _____
   Least: _____
   Expanded form: _____
   Word form: _____

4. Least: _____
   Expanded form: _____
   Word form: _____
   Greatest: _____
   Expanded form: _____
   Word form: _____

Differentiation Resource Book 2

Notes/Links

Place Value Unit_Supporting Activities

Resources

Reveal Platform

Matific Platform

Domain

Number and Operations in Base Ten

Standards

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

SMPs

MPs 7, 8

Key Vocabulary

Expanded Form
Standard Form
Word Form

Basic Numeracy Skills

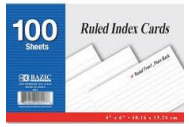
- ☐ Counting On
- ☐ Place Value
- ☐ Addition

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2-2 Round Multi-Digit Numbers

Learning Objectives

Students should be able to: Round numbers to the nearest 10 or nearest 100.

Towards Mastery	Mastery	Beyond Mastery
• **Students can round numbers to the nearest 10.** **Student activity:** "Rounding Check Challenge" **Materials Needed:** Index cards  **Instructions:** Each student takes three index cards. On each card, the student writes a statement where a two-digit number is rounded to the nearest 10.Example statements: "23 rounded to the nearest 10 is 20. ""56 rounded to the nearest 10 is 60. ""85 rounded to the nearest 10 is 90 The teacher collects all the cards. The teacher shuffles the cards. The teacher redistributes the cards, giving one card to each student. If there are not enough cards, some students can get two. **Check and Discuss:** Students read the statement on their card. Students determine if the rounding is correct. Students can work individually, in pairs, or in small groups to check their answers.	• **Students can round numbers to the nearest 100.** **Student activity:** Estimation Four In a Row **Materials Needed:** Game board, word problem cards, counters, and an answer key **Instructions:** Students play in groups of 2-3.Each group receives a game board, word problem cards, counters, and an answer key. Players decide who goes first **Gameplay:** Player 1 picks a word problem card and reads it aloud. Player 1 estimates the answer to the word problem. Player 1 covers the estimated answer on the game board with their counter. The "answer keeper" (another student or the teacher) checks the answer using the answer key. If the estimate is correct, the counter stays on the board. If the estimate is incorrect, the player removes their counter from the board. If a player cannot cover a box with a reasonable estimate, they lose their turn. The next player takes their turn.	• **Students can explain how to round numbers to the nearest 10 or 100 and relate it to the real-life applications** **Student activity:** "Railway Route Challenge" **Materials Needed:** Papers , pencils , ruler  **Instructions:** Students work individually or in small groups. They plan a railway system, including multiple stations. Students decide on the names of their stations. Students determine the distances between each station. **Diagram Creation:** Students draw a diagram of their railway system on the large paper or poster board. They accurately represent the stations and the railway lines connecting them. Students label each station with its name. Students label the distance between each pair of connected stations. **Extension Activities:** **Calculate Total Distance:** Students calculate the total distance of their railway system. **Create a Schedule:** Students create a train schedule, including arrival and departure times for each station, considering travel time based on the distances.

Domain

Number and Operations in Base Ten

Standards

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

SMPs

MPs 4,5

Key Vocabulary

Round
Discuss
Identify

Basic Numeracy Skills

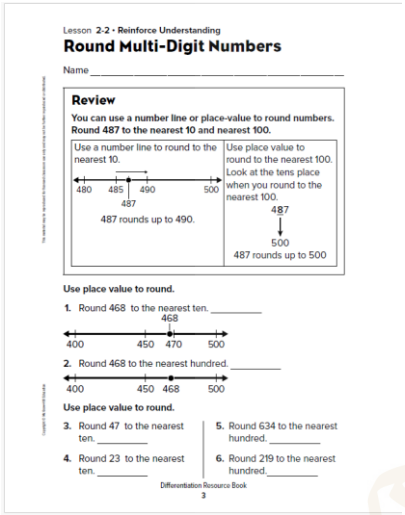
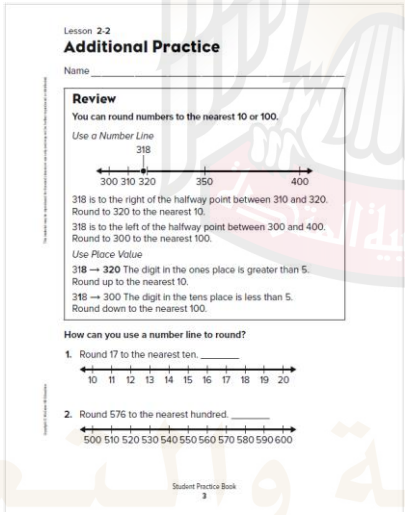
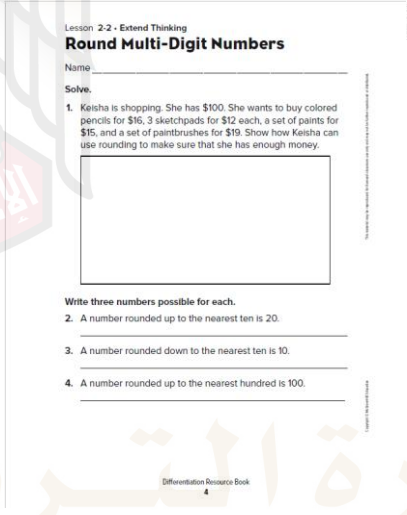
- ☐ Counting On
- ☐ Place Value
- ☐ Addition

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2-2 Round Multi-Digit Numbers

Learning Objectives

Students should be able to: Adjust numbers to help add or subtract

Towards Mastery	Mastery	Beyond Mastery
Share and Correct: The teacher can facilitate a class discussion where students share the statements on their cards and the correct rounded numbers. 	**Winning:** The first player to get four counters in a row (horizontally, vertically, or diagonally) wins the game. **All Materials are available in Game station Book on Reveal Platform Page 4 to 7**	**Real-World Application:** Students research real-world railway systems and compare them to their own designs. **Scale Drawing:** Students create a scale drawing of their railway. 
 Lesson 2-2 • Reinforce Understanding **Round Multi-Digit Numbers** Name _____ **Review** You can use a number line or place-value to round numbers. Round 487 to the nearest 10 and nearest 100. Use a number line to round to the nearest 10. 480 485 490 500 487 487 rounds up to 490. Use place value to round to the nearest 100. Look at the tens place when you round to the nearest 100. 487 500 487 rounds up to 500 **Use place value to round.** 1. Round 468 to the nearest ten. _____ 400 450 468 470 500 2. Round 468 to the nearest hundred. _____ 400 450 468 500 **Use place value to round.** 3. Round 47 to the nearest ten. _____ 4. Round 23 to the nearest ten. _____ 5. Round 634 to the nearest hundred. _____ 6. Round 219 to the nearest hundred. _____ Differentiation Resource Book 3	 Lesson 2-2 **Additional Practice** Name _____ **Review** You can round numbers to the nearest 10 or 100. *Use a Number Line* 318 300 310 320 350 400 318 is to the right of the halfway point between 310 and 320. Round to 320 to the nearest 10. 318 is to the left of the halfway point between 300 and 400. Round to 300 to the nearest 100. *Use Place Value* 318 → 320 The digit in the ones place is greater than 5. Round up to the nearest 10. 318 → 300 The digit in the tens place is less than 5. Round down to the nearest 100. **How can you use a number line to round?** 1. Round 17 to the nearest ten. _____ 10 11 12 13 14 15 16 17 18 19 20 2. Round 576 to the nearest hundred. _____ 500 510 520 530 540 550 560 570 580 590 600 Student Practice Book 3	 Lesson 2-2 • Extend Thinking **Round Multi-Digit Numbers** Name _____ **Solve.** 1. Keisha is shopping. She has $100. She wants to buy colored pencils for $16, 3 sketchpads for $12 each, a set of paints for $15, and a set of paintbrushes for $19. Show how Keisha can use rounding to make sure that she has enough money. **Write three numbers possible for each.** 2. A number rounded up to the nearest ten is 20. _____ 3. A number rounded down to the nearest ten is 10. _____ 4. A number rounded up to the nearest hundred is 100. _____ Differentiation Resource Book 4

Notes/Links

Place Value Unit Supporting Activities

Resources

Reveal Platform

Matific Platform

Domain

Number and Operations in Base Ten

Standards

3.NBT.A.1

Use place value understanding to round whole numbers to the nearest 10 or 100.

SMPs

MPs 4,5

Key Vocabulary

Round

Discuss

Identify

Basic Numeracy Skills

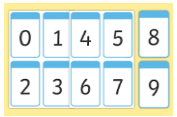
- ☐ Counting On
- ☐ Place Value
- ☐ Addition

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2-3 Estimate Sums and Differences

Learning Objectives
Students should be able to: Use compatible numbers to estimate a sum or difference.

Towards Mastery	Mastery	Beyond Mastery
• **Students estimate the sum or difference by rounding to nearest 10 Or 100.**	• **Students estimate the sum or difference by using Compatible Numbers.**	• **Students apply the concept of estimation in real life application.**
Student activity: "Close Enough?" **Materials:** Number cards (0-9, multiple sets) Paper and pencils for calculations **Instructions:** Students work in groups of three. Each group gets three sets of number cards. **Number Generation:** One student is the "Nu… Creator." This student draws six cards and forms two 3-digit numbers (or four cards for two 2-digit numbers, depending on the skill level). **Estimation Challenge:** The other students in the group are the "Estimators." These students use either rounding or compatible numbers to estimate the *sum* and/or the *difference* of the two numbers created. **Discussion:** Students discuss their estimation strategies and compare their estimates. They determine whether their estimates are greater than or less than the actual sum or difference. The Number Creator can use a calculator or do the actual calculation on paper to find the exact answer.	**Students Activity:** Estimation Bumb **Instructions:** Students play in groups of 3 or more. Each player chooses a color and takes 10 counters of that color. The group decides who goes first. **Gameplay**: Player 1 picks a number ca… addition problem. Player 1 estimates the sum to the nearest 50, 100, 150, 200, 250, or 300.The "answer keeper" (another student or the teacher) checks the estimate using the answer key. If the estimate is correct, Player 1 places a counter on the corresponding space on the game board. If the estimate is incorrect, Player 1 loses their turn. Player 2 takes their turn, and so on. **Winning**: The first player to get rid of all their counters wins. • **All Materials are available in Game station Book on Reveal Platform Page 8 to 12**	**Student activity:** "Eyes on the Forest" **Instructions:** Discuss the purpose of fire towers and how they help in forest fire detection. Show pictures or videos of real fire towers. Discuss the design considerations for a fire… tower:\Height for visibility Stability and strength to withstand wind and weather A platform for the observer Accessibility (how a ranger gets to the top) **Design Planning**: Students work individually or in small groups. Each student/group plans their fire tower design on paper. The plan should include: A sketch of the tower Planned height Materials to be used How the tower will be made stable (e.g., base size, supporting structures)A way to represent the observation deck (Optional) Angles of supports **Building Phase**: Students build their fire tower models based on their designs. Encourage them to be creative and problem-solve any construction challenges. Ensure they are using materials safely.







Domain
Number and Operations in Base Ten

Standards
3.NBT.A.1
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.

SMPs
MPs 5,7

Key Vocabulary
Estimate
Compatible Number
Reason

Basic Numeracy Skills

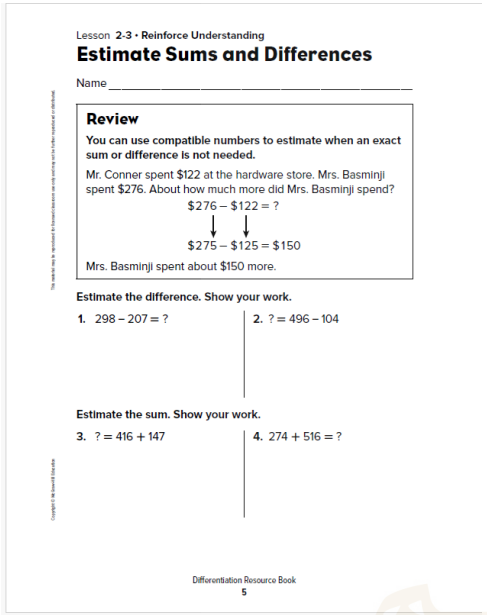
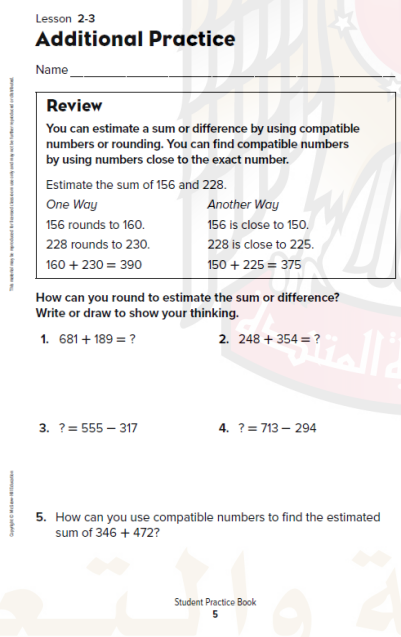
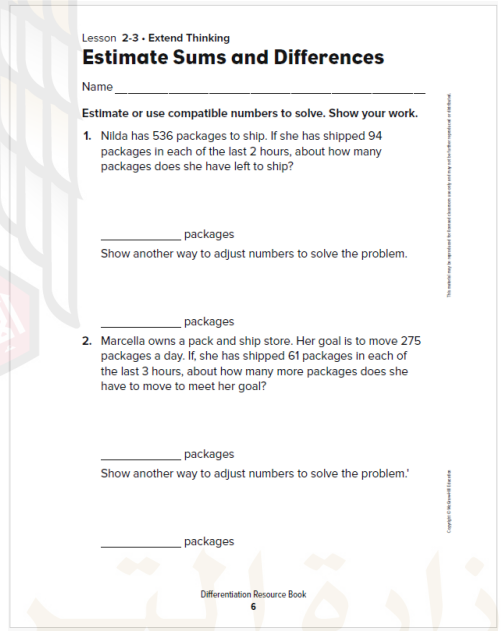
- ☐ Addition
- ☐ Subtraction

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2-3 Estimate Sums and Differences

Learning Objectives

Students should be able to: Use compatible numbers to estimate a sum or difference.

Towards Mastery	Mastery	Beyond Mastery
		

Lesson 2-3 • Reinforce Understanding

Estimate Sums and Differences

Name _____

Review

You can use compatible numbers to estimate when an exact sum or difference is not needed.

Mr. Conner spent $122 at the hardware store. Mrs. Basminji spent $276. About how much more did Mrs. Basminji spend?

$276 – $122 = ?

↓ ↓

$275 – $125 = $150

Mrs. Basminji spent about $150 more.

Estimate the difference. Show your work.

1. 298 – 207 = ?
2. ? = 496 – 104

Estimate the sum. Show your work.

3. ? = 416 + 147
4. 274 + 516 = ?

Differentiation Resource Book 5

Lesson 2-3

Additional Practice

Name _____

Review

You can estimate a sum or difference by using compatible numbers or rounding. You can find compatible numbers by using numbers close to the exact number.

Estimate the sum of 156 and 228.

One Way	*Another Way*
156 rounds to 160.	156 is close to 150.
228 rounds to 230.	228 is close to 225.
160 + 230 = 390	150 + 225 = 375

How can you round to estimate the sum or difference? Write or draw to show your thinking.

1. 681 + 189 = ?
2. 248 + 354 = ?
3. ? = 555 – 317
4. ? = 713 – 294
5. How can you use compatible numbers to find the estimated sum of 346 + 472?

Student Practice Book 5

Lesson 2-3 • Extend Thinking

Estimate Sums and Differences

Name _____

Estimate or use compatible numbers to solve. Show your work.

1. Nilda has 536 packages to ship. If she has shipped 94 packages in each of the last 2 hours, about how many packages does she have left to ship?

_____ packages

Show another way to adjust numbers to solve the problem.

_____ packages

2. Marcella owns a pack and ship store. Her goal is to move 275 packages a day. If, she has shipped 61 packages in each of the last 3 hours, about how many more packages does she have to move to meet her goal?

_____ packages

Show another way to adjust numbers to solve the problem.'

_____ packages

Differentiation Resource Book 6

Notes/Links

Place Value Unit Supporting Activities

Resources

Reveal Platform

Matific Platform

Domain

Number and Operations in Base Ten

Standards

3.NBT.A.1

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.

SMPs

MPs 5,7

Key Vocabulary

Estimate

Compatible Number

Reason

Basic Numeracy Skills

- ☐ Addition
- ☐ Subtraction

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2-4 Use Addition Properties to Add

Learning Objectives

Students should be able to: Apply the properties of addition when adding two or more addends.

Towards Mastery	Mastery	Beyond Mastery
• **Students can group the numbers or change their order to add.**	• **Students engage in additional practice to group numbers or rearrange their order to facilitate addition.**	• **Students explain and apply how to use addition properties to add more efficiently.**
Student activity: "Spin, Add, Build" **Instructions:** **Pair Up:** Work with a partner. **Spin and Create:** Take turns spinning the spinner. Each pair should spin a total of six times. Use the numbers you spin to create three 2-digit numbers. For example, if you spin a 2 and a 5, that's 25. **Add Them Up:** Add the three 2-digit numbers together. Write down the addition problem. **Show Your Work:** Use base-ten blocks to show how you added the numbers. **Different Ways:** Show the addition problem in two different ways using the base-ten blocks. For example, if you are adding 25 + 13 + 31, you can show all the tens together and all the ones together. Then, you can regroup ten ones into a ten-rod. **Example:** Let's say you spin these numbers: 2, 5, 1, 3, 3, 1. You can make these two-digit numbers: 25, 13, and 31. You would then add: 25 + 13 + 31 = ?	In this stage, we do not focus on naming the property; instead, we emphasize understanding it and applying it correctly. **Student activity:** Property Concentration **Instructions:** **Prepare the Cards:** Shuffle the number cards and place them face down in an array. **Player's Turn:** The first player flips over two cards. **Compare Sums:** The player uses the properties of addition (commutative property, associative property) to determine if the sums of the two cards are the same. Commutative Property: a + b = b + a Associative Property: (a + b) + c = a + (b + c) **Declare a Match:** The player tells the "answer keeper" if they think the sums are the same. **Check the Answer Key:** The answer keeper checks the answer key to see if the player is correct. **Keep or Flip Back:** If the sums match, the player keeps the cards. If the sums do not match, the player turns the cards face down again. **Next Player's Turn:** The next player takes their turn. • **All Materials are available in Game station Book on Reveal Platform Page 13 to 15**	**Student activity:** "Build Your Budget Playground" **Instructions:** **Understand the Budget:** Your school has a set amount of money to spend on new playground equipment. Your teacher will tell you the budget. **Explore the Equipment:** Look at the list of playground equipment and how much each item costs. **Plan Your Purchases:** Work individually or in small groups to decide what equipment you would buy for the playground.  **Stay Within Budget:** Add up the equipment you choose. The total cost must be equal to or less than the school's budget. **Create Your List:** Write down the name of each piece of equipment you want to buy and its price. Show the total cost of your purchases. **Justify Your Choices:** Be prepared to explain why you chose the equipment you did. Why is it important for the playground? **Share Your Plan:** Share your equipment list with the class. Compare your choices with other groups.

Domain

Number and Operations in Base Ten

Standards

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.

SMPs

MPs 6,7

Key Vocabulary

Addend
Justify
Strategy

Basic Numeracy Skills

- ☐ Counting On
- ☐ Place Value
- ☐ Addition

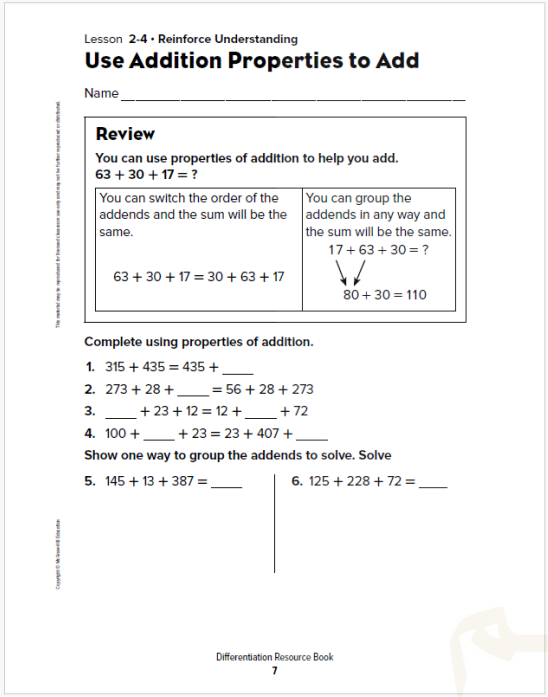
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2-4 Use Addition Properties to Add

Learning Objectives

Students should be able to: Apply the properties of addition when adding two or more addends

Towards Mastery



Lesson 2-4 • Reinforce Understanding

Use Addition Properties to Add

Name _____

Review

You can use properties of addition to help you add.
63 + 30 + 17 = ?

You can switch the order of the addends and the sum will be the same.	You can group the addends in any way and the sum will be the same.
63 + 30 + 17 = 30 + 63 + 17	17 + 63 + 30 = ? ↓ 80 + 30 = 110

Complete using properties of addition.

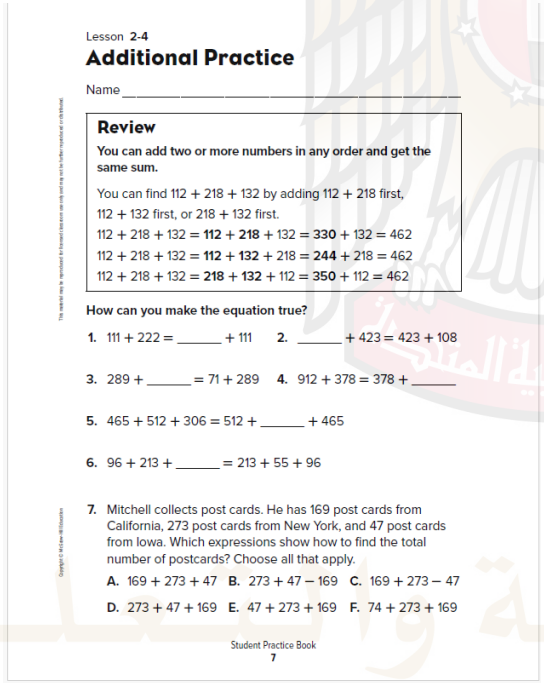
1. 315 + 435 = 435 + ____
2. 273 + 28 + ____ = 56 + 28 + 273
3. ____ + 23 + 12 = 12 + ____ + 72
4. 100 + ____ + 23 = 23 + 407 + ____

Show one way to group the addends to solve. Solve

5. 145 + 13 + 387 = ____
6. 125 + 228 + 72 = ____

Differentiation Resource Book
7

Mastery



Lesson 2-4

Additional Practice

Name _____

Review

You can add two or more numbers in any order and get the same sum.

You can find 112 + 218 + 132 by adding 112 + 218 first, 112 + 132 first, or 218 + 132 first.
112 + 218 + 132 = **112** + **218** + 132 = **330** + 132 = 462
112 + 218 + 132 = **112** + **132** + 218 = **244** + 218 = 462
112 + 218 + 132 = **218** + **132** + 112 = **350** + 112 = 462

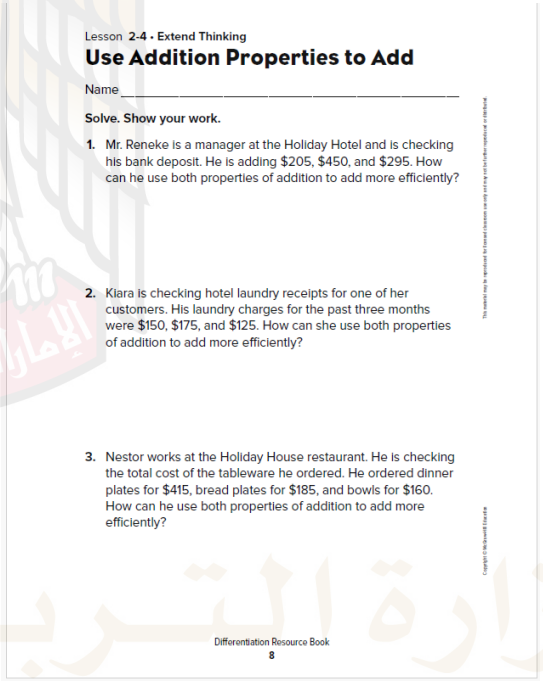
How can you make the equation true?

1. 111 + 222 = _____ + 111
2. _____ + 423 = 423 + 108
3. 289 + _____ = 71 + 289
4. 912 + 378 = 378 + _____
5. 465 + 512 + 306 = 512 + _____ + 465
6. 96 + 213 + _____ = 213 + 55 + 96
7. Mitchell collects post cards. He has 169 post cards from California, 273 post cards from New York, and 47 post cards from Iowa. Which expressions show how to find the total number of postcards? Choose all that apply.

A. 169 + 273 + 47 B. 273 + 47 − 169 C. 169 + 273 − 47
D. 273 + 47 + 169 E. 47 + 273 + 169 F. 74 + 273 + 169

Student Practice Book
7

Beyond Mastery



Lesson 2-4 • Extend Thinking

Use Addition Properties to Add

Name _____

Solve. Show your work.

1. Mr. Reneke is a manager at the Holiday Hotel and is checking his bank deposit. He is adding $205, $450, and $295. How can he use both properties of addition to add more efficiently?
2. Kiara is checking hotel laundry receipts for one of her customers. His laundry charges for the past three months were $150, $175, and $125. How can she use both properties of addition to add more efficiently?
3. Nestor works at the Holiday House restaurant. He is checking the total cost of the tableware he ordered. He ordered dinner plates for $415, bread plates for $185, and bowls for $160. How can he use both properties of addition to add more efficiently?

Differentiation Resource Book
8

Domain

Number and Operations in Base Ten

Standards

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.

SMPs

MPs 6,7

Key Vocabulary

Addend
Justify
Strategy

Basic Numeracy Skills

- ☐ Counting On
- ☐ Place Value
- ☐ Addition

Notes/Links

Place Value Unit Supporting Activities

Resources

Reveal Platform
Matific Platform

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2-5 Addition Patterns

Learning Objectives

Students should be able to: Identify addition patterns and use the patterns to help determine sums of 3-digit numbers and check their accuracy.

Towards Mastery	Mastery	Beyond Mastery
• **Students can determine whether the answer of adding two 2-digit numbers will be odd or even before finding the result.** **Student activity:** "Odd or Even? Predict & Prove!" **Instructions:** **Pair Up:** Work with a partner. **Roll the Cube:** The first student rolls the number cube twice to get two single-digit numbers. **Create 2-Digit Addends:** Use the two numbers from the cube to create two 2-digit addends. For example, if you roll a 3 and a 5, your addends could be 35 and 53, or 33 and 55. **Predict the Sum:** Without adding the numbers, the other student says whether the sum of the two 2-digit numbers will be odd or even. **Explain Your Reasoning:** The student explains how they know if the sum will be odd or even. Here's how to think about it: Even + Even = Even Odd + Odd = Even Odd + Even = Odd Even + Odd = Odd **Check Your Answer:** Add the two numbers to check if the prediction was correct. **Switch Roles:** The students switch roles and repeat the steps.	• **Students can determine whether the answer of adding two 3-digit numbers will be odd or even before finding the result.** **Student activity:** Addition Pattern Bumb **Instructions:** **Choose Counters:** Each player chooses a different color of counters and takes 10 of that color. **Pick a Card:** Players take turns picking a card with an addition equation. **Identify the Pattern:** The player decides which addition pattern describes the equation on their card. **Check with Answer Keeper:** The "answer keeper" checks the answer using the answer key. **Place Counter:** If the player is correct and the pattern space on the board is empty, they place one of their counters on that space. If the space has another player's counter, the correct player can "bump" it off and place their counter there. If the space has one or more of the player's counters, they can add another counter to make the space "safe. "If the space has two or more of another player's counters, the player's turn ends without placing a counter. **All Materials are available in Game station Book on Reveal Platform Page 16 to 19**	• **Students can accurately determine and explain whether the answer of adding two 3-digit numbers will be odd or even before finding the result.** **Student activity:** "Roll, Arrange, Predict!" **Instructions for Students:** **Pair Up:** Work with your partner as in the original activity. **Roll the Dice:** Roll the number cube **six times** to create **two 3-digit numbers** (e.g., 431 and 625).Students must **choose how to arrange** the digits to create the largest or smallest possible sum or a target value . **Predict the Sum's Parity and Reason:** One student **predicts whether the sum is odd or even** before calculating. They must also **justify their prediction using number properties**. **Bonus Challenge – Pattern Detective:** Create a list of at least **five different 3 -digit pairs** Record if the sum is odd or even. Look for patterns: Does it always follow the odd/even rule? **Create Your Own Riddle:** Example: “I added two 3-digit numbers. One was even and the other was odd. The sum was odd. What might my numbers be?

Domain

Operations and Algebraic Thinking

Standards

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

SMPs

MPs 8

Key Vocabulary

Even Number
Odd Number
Analyz
Identify

Basic Numeracy Skills

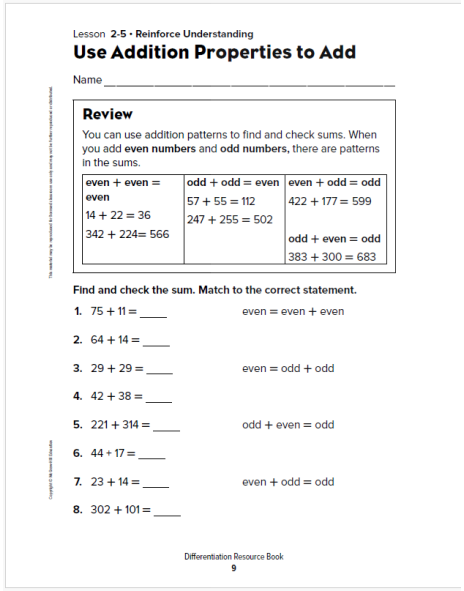
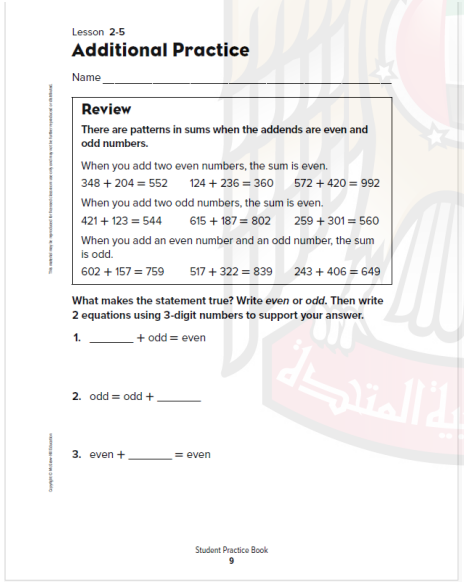
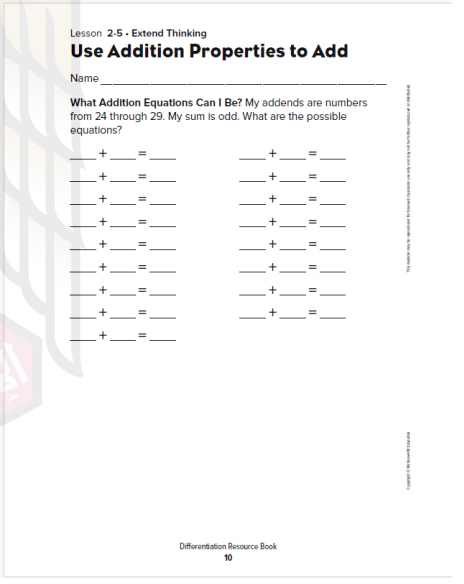
- ☐ Counting On
- ☐ Place Value
- ☐ Addition

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2-5 Addition Patterns

Learning Objectives

Students should be able to: Identify addition patterns and use the patterns to help determine sums of 3-digit numbers and check their accuracy.

Towards Mastery	Mastery	Beyond Mastery
		

Domain

Operations and Algebraic Thinking

Standards

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

SMPs

MPs 8

Key Vocabulary

Even Number
Odd Number
Analyz
Identify

Basic Numeracy Skills

- ☐ Counting On
- ☐ Place Value
- ☐ Addition

Notes/Links

Place Value Unit Supporting Activities

Resources

Reveal Platform
Matific Platform

MINISTRY OF EDUCATION

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2-6 Use Partial Sums to Add

Learning Objectives
Students should be able to: Use partial sums to add 3-digit numbers.

Towards Mastery	Mastery	Beyond Mastery
• **Students can decompose 3- digit numbers into hundreds , tens , ones to add them.** 🔢 **Student activity:** "Pay the Bill: Money Math Challenge!" 📝 **Instructions:** **Get Your Bills and Money:** The teacher will give you a "bill" with two 3-digit numbers on it. You'll also get your play money.  **Decompose the Numbers:** Use the play money to show each of the 3-digit numbers on your bill. For example, if a number is 243, you would use two $100 bills, four $10 bills, and three $1 bills. **Add the Numbers:** Add the two amounts of play money together to find the total "billed amount." **Regroup, if Needed:** If you have more than ten $1 bills, trade ten of them for one $10 bill. If you have more than ten $10 bills, trade ten of them for one $100 bill. **Record Your Work:** Write down the addition problem and the total amount. **Get a New Bill:** The teacher will give you a new "bill" with different numbers. Repeat steps 2-5.	• **Students can use partial sum to add 3- digit numbers.** 🔢 **Student activity:** Partial Sums Showdown 📝 **Instructions:** **Shuffle and Deal:** Shuffle the deck of cards and place them in a pile, face down. **Pick a Card:** Each player picks one card from the pile. **Find the Sum:** Each player adds the hundreds, tens, and ones of the 3-digit number on their card. They record their sum on their paper. **Check Answers:** The "answer keeper" (a designated student or the teacher) checks the answers using the answer key. **Determine the Winner:** The player with the greatest sum wins that round and keeps both cards. **Repeat:** Players pick new cards, find the sums, and determine the winner for the next round. **Game End:** The game ends when all the cards are gone. **Count Cards:** The player with the most cards wins the game • **All Materials are available in Game station Book on Reveal Platform Page 20 to 24**	• **Students can accurately and fluently use partial sum to add 3- digit numbers in the real-life scenarios** 🔢 **Student activity:** "Class Trip Cost Challenge" 🧱 **Materials Needed:** Printed field trip cost menus (bus rental: 425 AED, tickets: 312 AED, snacks: 174 AED, tour guide: 189 AED, etc.) “Trip Budget Planner” worksheet Whiteboards or math journals Pencils and markers 📝 **Instructions:** **Set the Scenario:** Tell the students they are in charge of planning a class field trip. They must choose three or more expenses to include in their plan (from the provided cost menu). **Calculate Using Partial Sums:** For each plan, students use partial sums to add the costs: Add hundreds Add tens Add ones Then combine all for the total **Example:** 312+174+189=(300+100+100)+(10+70+80)+(2+4+9)=500+160+15=675

Domain
Number and Operations in Base Ten

Standards
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.

SMPs
MPs 3

Key Vocabulary
Decompose
Partial Sum
Strategy
Support

Basic Numeracy Skills

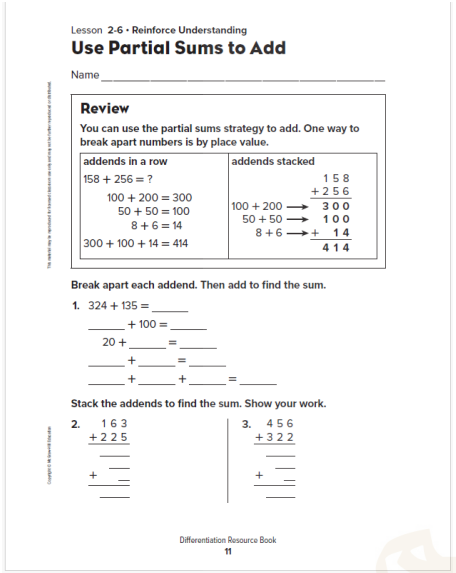
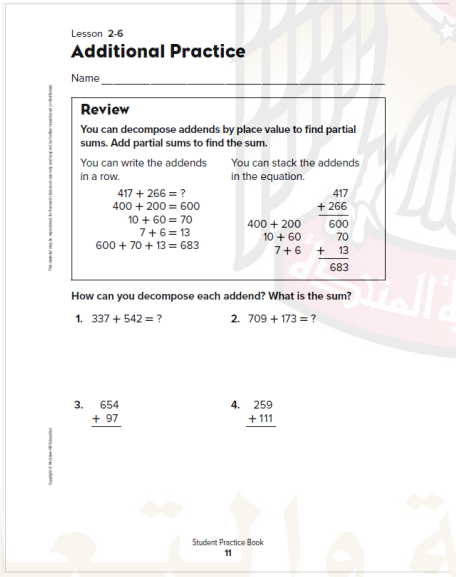
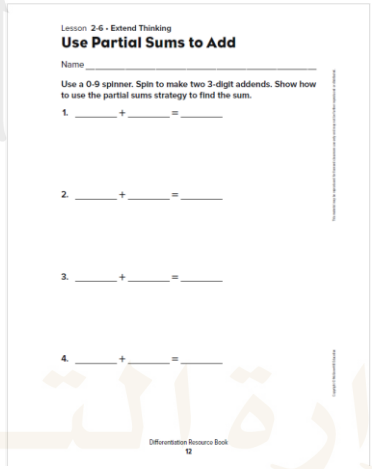
- ☐ Counting On
- ☐ Place Value
- ☐ Addition

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2-6 Use Partial Sums to Add

Learning Objectives

Students should be able to: Use partial sums to add 3-digit numbers.

Towards Mastery	Mastery	Beyond Mastery
		**Compare & Evaluate:** Ask students to compare totals with other groups or set a budget limit (e.g., 700 AED) and see who can stay under it while including the most services. **Optional Extension:** Challenge students to reverse the task: give them a total cost and ask them to figure out a combination of items that matches it using estimation and partial sums. 

Domain

Number and Operations in Base Ten

Standards

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.

SMPs

MPs 3

Key Vocabulary

Decompose
Partial Sum
Strategy
Support

Basic Numeracy Skills

- ☐ Counting On
- ☐ Place Value
- ☐ Addition

Notes/Links

Place Value Unit Supporting Activities

Resources

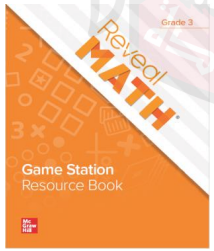
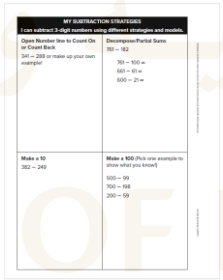
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2-7 Decompose to Subtract

Learning Objectives
Students should be able to: Decompose one number in different ways to subtract.

Towards Mastery	Mastery	Beyond Mastery
• **Students can decompose 3- digit numbers by place value.** **Student activity:** "Subtract & Split!" **Instructions:** **Write the Problem:** One student writes down a subtraction problem with two 3-digit numbers. **Decompose the Numbers:** Together, decompose the numbers into hundreds, tens, and ones. For example, if the problem is 345 - 123, decompose it like this: 345 = 300 + 40 + 5 123 = 100 + 20 + 3 **Subtract:** Subtract the hundreds, then the tens, then the ones. **Find the Difference:** Add the results from step 4 to find the difference **Record Your Work:** Write down each step of your work. **Check Your Answer:** Have your partner check your answer. **Try Another Way:** Work with your partner to find another way to decompose the numbers to solve the same problem. For example, instead of decomposing 345 as 300 + 40 + 5, you could decompose it as 200 + 140 + 5. **Switch Roles:** Switch roles with your partner and repeat the activity.	• **Students can decompose 3- digit numbers in different ways to subtract.** **Student activity:** My subtraction Strategies Task Cards • Answer **My subtraction Strategies Task Cards** in Game Station Resource Book Pages 25 to 27   	• **Students can explain how to decompose 3-digit numbers in different ways to subtract .** **Student activity:** "Regroup & Reason" **Instructions:** **Pick or Create a Problem:** Each student writes or selects a subtraction problem with two 3-digit numbers. *Example: 462 – 185* **Solve It Two Different Ways:** Use **two different decomposition strategies** to solve the same problem. **Standard decomposition**: 462 = 400 + 60 + 2 **Creative regrouping**: 462 = 300 + 160 + 2 *(Let them choose the second way)* **Explain the Strategy:** Write a short explanation: *"I regrouped 100 from the hundreds and added it to the tens so I could subtract 80 more easily."* **Compare Methods:** Which method was easier? Which had more steps Did both give the same answer? **Create a Peer Challenge:** Write your own subtraction problem and a **partially decomposed version** (with missing parts). Ask a classmate to **complete the decomposition** and solve it.

Domain
Number and Operations in Base Ten

Standards
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.

SMPs
MPs 2,3

Key Vocabulary
Decompose
Defend
Strategy

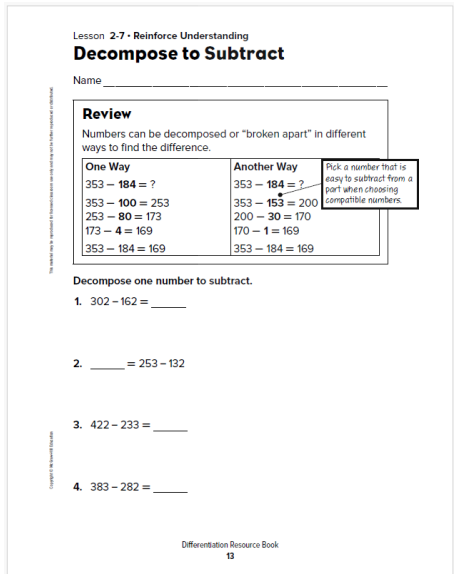
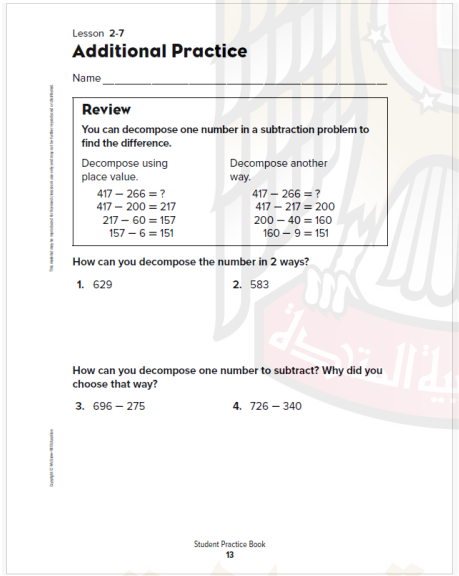
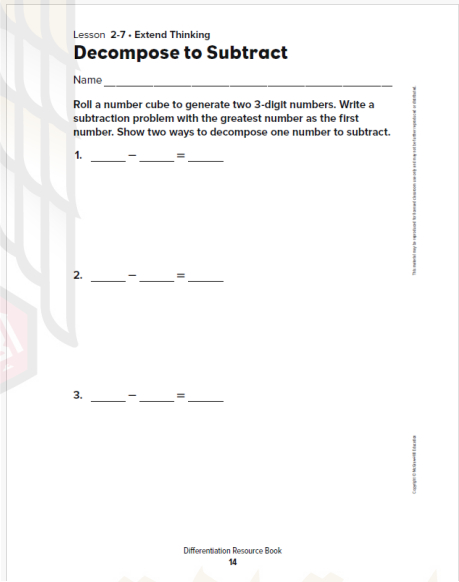
Basic Numeracy Skills

- ☐ Counting On
- ☐ Place Value
- ☐ Addition

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2-7 Decompose to Subtract

Learning Objectives
Students should be able to: Decompose one number in different ways to subtract.

Towards Mastery	Mastery	Beyond Mastery
		

Lesson 2-7 • Reinforce Understanding
Decompose to Subtract
Name _____

Review
Numbers can be decomposed or "broken apart" in different ways to find the difference.

One Way	Another Way
353 − **184** = ?	353 − **184** = ?
353 − **100** = 253	353 − **153** = 200
253 − **80** = 173	200 − **30** = 170
173 − **4** = 169	170 − **1** = 169
353 − 184 = 169	353 − 184 = 169

Pick a number that is easy to subtract from a part when choosing compatible numbers.

Decompose one number to subtract.
1. 302 − 162 = _____
2. _____ = 253 − 132
3. 422 − 233 = _____
4. 383 − 282 = _____

Differentiation Resource Book
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Lesson 2-7
Additional Practice
Name _____

Review
You can decompose one number in a subtraction problem to find the difference.

Decompose using place value.	Decompose another way.
417 − 266 = ?	417 − 266 = ?
417 − 200 = 217	417 − 217 = 200
217 − 60 = 157	200 − 40 = 160
157 − 6 = 151	160 − 9 = 151

How can you decompose the number in 2 ways?
1. 629
2. 583

How can you decompose one number to subtract? Why did you choose that way?
3. 696 − 275
4. 726 − 340

Student Practice Book
13

Lesson 2-7 • Extend Thinking
Decompose to Subtract
Name _____

Roll a number cube to generate two 3-digit numbers. Write a subtraction problem with the greatest number as the first number. Show two ways to decompose one number to subtract.
1. _____ − _____ = _____
2. _____ − _____ = _____
3. _____ − _____ = _____

Differentiation Resource Book
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Domain
Number and Operations in Base Ten

Standards
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.

SMPs
MPs 2,3

Key Vocabulary
Decompose
Defend
Strategy

Notes/Links
Place Value Unit Supporting Activities

Resources
Reveal Platform
Matific Platform

Basic Numeracy Skills

- ☐ Counting On
- ☐ Place Value
- ☐ Addition

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2-8 Adjust Numbers to Add or Subtract

Learning Objectives

Students should be able to: Adjust numbers to help add or subtract.

Towards Mastery	Mastery	Beyond Mastery
• **Students can change numbers of the addition or subtraction equation and keep the same answer.** **Student activity:** "Shift to Solve!" **Instructions:** **Start with an Equation:** Your teacher will give you a subtraction equation with two-digit numbers (e.g., 85 - 37 = 48). **Adjust the Numbers:** Your task is to change the numbers in the equation to create a *different* equation that has the *same* difference. You can adjust both numbers, but they must be adjusted in the same direction. **Write the New Equation:** Write down your new subtraction equation. **Find the Difference:** Solve your new equation to make sure the difference is still the same. **Compare Strategies:** Compare your new equation with your partner's equation. Discuss which equation was easier to solve. Why? (Which was more *efficient*?) **Explain on a Number Line:** (Optional) Use a number line to show how the numbers were adjusted in both equations. This will help you see why the difference remains the same.	• **Students can adjust numbers to help add or subtract.** **Student activity:** Subtracting with Compatible Numbers Tic Tac Toe **Instructions:** **Decide Order:** Decide who will go first, second, and third. **Choose Symbols:** Decide who will be X and who will be O. The third player can be a checker or alternate between X and O. **Choose a Box:** The first player chooses a box on the Tic Tac Toe board. **Find the Difference:** The player finds the difference for the subtraction problem in that box, using compatible numbers. **Check the Answer:** The "answer keeper" (the third player or a designated player) checks the answer with the answer key. **Mark the Box:** If the player is correct, they draw their X or O in the box. **Take Turns:** Players take turns choosing a box, solving the problem, and marking the box if they are correct. **Win:** The first player to get three in a row (horizontally, vertically, or diagonally) wins. **Play Again:** You may play again with new roles or a new board. **All Materials are available in Game station Book on Reveal Platform Page 28 to 30**	**Students can adjust numbers to help add or subtract in real life scenarios.** **Student Activity:: "**Bus Stop Balancer**"** **Instructions:** **Materials Needed:** "Bus Route" worksheet with different stops and passenger numbers Toy bus cutouts or icons (optional for visuals) Whiteboards or math journals Markers or pencils **Instructions:** **Set the Scene:** You are the bus monitor! As your bus stops at each station, passengers **get on** or **get off**. You need to keep track of the total number of passengers, but instead of exact math, you use **adjusted numbers** to work faster. **Example:** Stop 1: 76 passengers on board Stop 2: 48 more get on → Adjust to 50, so: 76 + 50 = 126, then subtract 2 → **124** Stop 3: 37 get off → Adjust to 40, so: 124 – 40 = 84, then add 3 → **87** **Student Activity:** Each student or pair follows a series of "bus stops" with boarding and leaving numbers. They must **adjust**, **calculate**, and **compensate** at each stop to track how many passengers are on the bus.

Domain

Number and Operations in Base Ten

Standards

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.

SMPs

MPs 5,7

Key Vocabulary

Difference
Sum
Adjust
Process

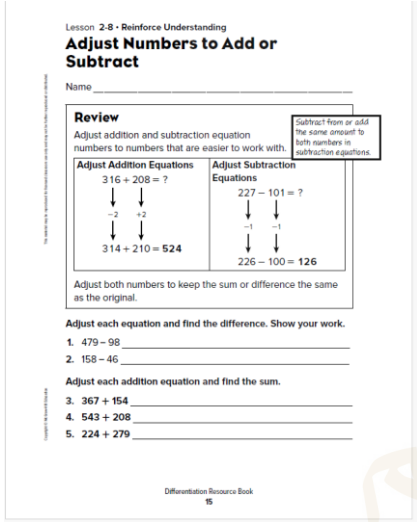
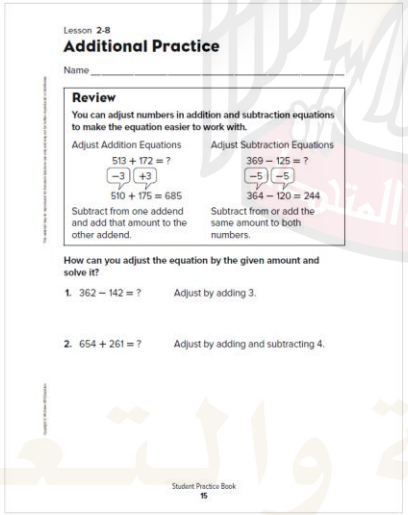
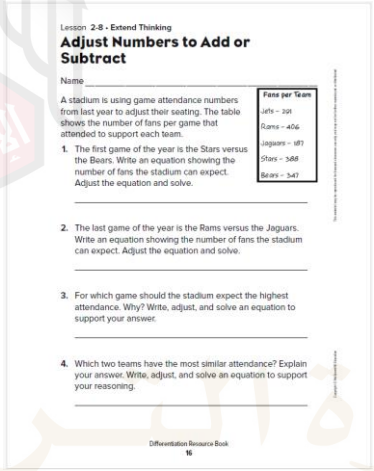
Basic Numeracy Skills

- ☐ Addition
- ☐ Counting Back
- ☐ Subtraction

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2-8 Adjust Numbers to Add or Subtract

Learning Objectives
Students should be able to: Adjust numbers to help add or subtract.

Towards Mastery	Mastery	Beyond Mastery
		**Discussion:** Talk about why certain numbers were adjusted and how it helped with mental math. **Extension Option:** Add a challenge where students create their own “bus routes” with their own adjusted numbers and swap with a classmate to solve. 

Domain
Number and Operations in Base Ten

Standards
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.

SMPs
MPs 5,7

Key Vocabulary
Difference
Sum
Adjust
Process

Notes/Links
Place Value Unit Supporting Activities

Resources
Reveal Platform
Matific Platform

Basic Numeracy Skills

- ☐ Addition
- ☐ Counting Back
- ☐ Subtraction

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2-9 Use Addition to Subtract

Learning Objectives

Students should be able to: Use related addition equations to find the difference.

Towards Mastery	Mastery	Beyond Mastery
• **Students will generate and solve two-digit addition problems using number cubes and write related subtraction equations to demonstrate understanding of the relationship between addition and subtraction.** **Student Activity:** "Dice Fact Families"  **Materials:** Two number cubes (with standard 1-6 numbering) **Instructions:** **Pair Up:** Work with a partner. **Roll the Cubes:** Take turns rolling the two number cubes. The numbers you roll will be used to create two-digit addends. For example, if you roll a 3 and a 5, you can create the numbers 35 and 53. **Find the Sum:** Add the two 2-digit numbers you created. Record the addition equation. **Write Related Subtraction Equations:** Use the sum and the two addends to write two related subtraction equations. Remember, for every addition equation, there are two related subtraction equations. **Use Base-Ten Blocks (Optional):** If you need help visualizing the problem, use base-ten blocks to model the addition and subtraction. **Check Your Work:** Make sure your subtraction equations are correct. **Switch Roles:** Switch roles with your partner and repeat the activity.	• **Students will identify and match related addition and subtraction facts to reinforce understanding of fact families and the relationship between operations.** **Student Activity:** Addition & Subtraction Concentration **Instructions:** **Prepare the Cards:** Turn the cards face down in an "Addition" group and a "Subtraction" group. **Take Turns:** When it is your turn, flip over one card from each group. **Find the Sum and Check for a Match:** Find the sum of the numbers on the addition card. Then, determine if the subtraction card shows a related subtraction fact. Tell the answer keeper if you think the cards match. **Check the Answer:** The answer keeper checks the answer key to see if you are correct. **Keep or Discard:** If the cards match, you keep the cards. If there is no match, turn the cards face down again. Now it is the next player's turn. **Determine the Winner:** Whoever has the most cards at the end of the game wins. • **All Materials are available in Game station Book on Reveal Platform Page 31 to 33**	• **Students will fluently and accurately identify and match related addition and subtraction equations.** **Student Activity:** "Equation Match-Up!" **Materials:** Deck of cards with addition and subtraction equations ,Paper, Pencils **Instructions:** Create a set of cards with related addition and subtraction equations. Each set should have three cards: one addition equation and two related subtraction equations. For example: Card 1: 36 + 28 = 64, Card 2: 64 - 36 = 28 Card 3: 64 - 28 = 36 Divide the cards into two groups: "Addition" and "Subtraction". Turn all cards face down. **Divide Cards:** Turn the cards face down in an "Addition" group and a "Subtraction" group. **Take Turns:** When it is your turn, flip over one card from each group. **Find the Sum and Check for a Match:** Look at the addition card. Use the addition equation to help you solve the subtraction problem on the subtraction card you flipped over. Tell the answer keeper if you think the cards match. A "match" is when the subtraction card is a related subtraction fact to the addition card. **Keep or Discard: If** the cards match, you keep the cards. If there is no match, turn the cards face down again. Now it is the next player's turn. **Determine the Winner:** Whoever has the most cards at the end of the game wins.

Domain

Number and Operations in Base Ten

Standards

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.

SMPs

MPs 2,7

Key Vocabulary

Bar Diagram
Conclude
Comparison

Basic Numeracy Skills

- ☐ Addition
- ☐ Counting Back
- ☐ Subtraction

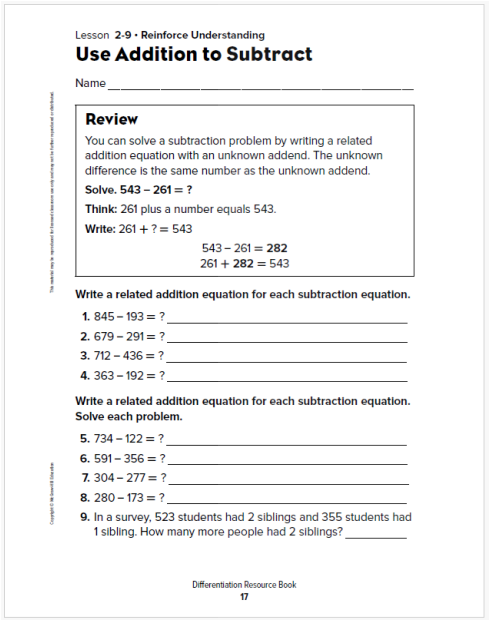
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2-9 Use Addition to Subtract

Learning Objectives

Students should be able to: Use related addition equations to find the difference.

Towards Mastery	Mastery	Beyond Mastery



Lesson 2-9 • Reinforce Understanding

Use Addition to Subtract

Name _____

Review

You can solve a subtraction problem by writing a related addition equation with an unknown addend. The unknown difference is the same number as the unknown addend.

Solve. 543 – 261 = ?

Think: 261 plus a number equals 543.

Write: 261 + ? = 543

543 – 261 = **282**
261 + **282** = 543

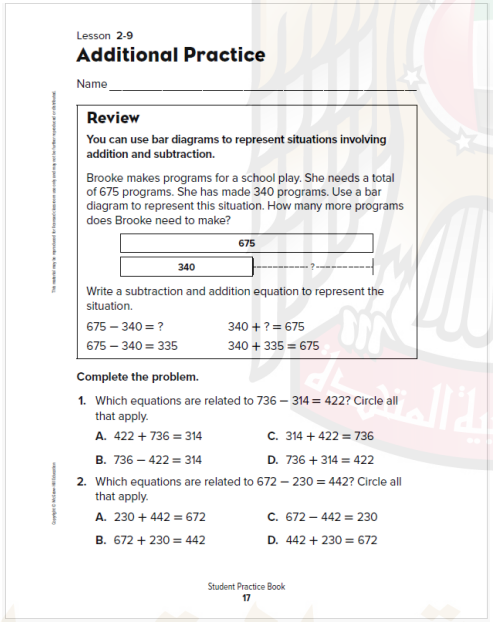
Write a related addition equation for each subtraction equation.

1. 845 – 193 = ? _____
2. 679 – 291 = ? _____
3. 712 – 436 = ? _____
4. 363 – 192 = ? _____

Write a related addition equation for each subtraction equation. Solve each problem.

5. 734 – 122 = ? _____
6. 591 – 356 = ? _____
7. 304 – 277 = ? _____
8. 280 – 173 = ? _____
9. In a survey, 523 students had 2 siblings and 355 students had 1 sibling. How many more people had 2 siblings? _____

Differentiation Resource Book
17



Lesson 2-9

Additional Practice

Name _____

Review

You can use bar diagrams to represent situations involving addition and subtraction.

Brooke makes programs for a school play. She needs a total of 675 programs. She has made 340 programs. Use a bar diagram to represent this situation. How many more programs does Brooke need to make?

675

340 ---------- ? ----------

Write a subtraction and addition equation to represent the situation.

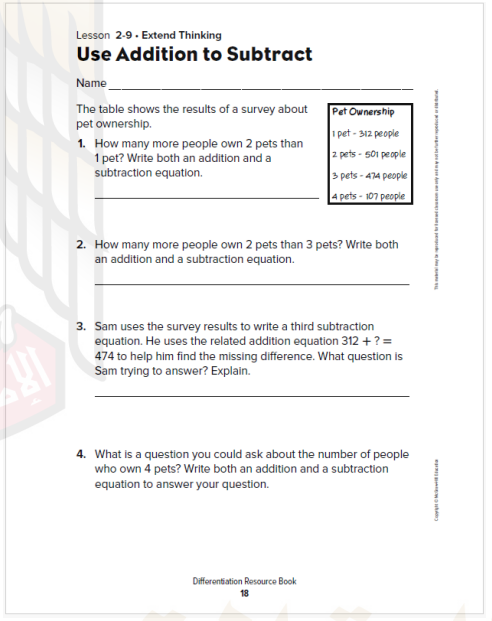
675 – 340 = ? 340 + ? = 675

675 – 340 = 335 340 + 335 = 675

Complete the problem.

1. Which equations are related to 736 – 314 = 422? Circle all that apply.
   - A. 422 + 736 = 314
   - B. 736 – 422 = 314
   - C. 314 + 422 = 736
   - D. 736 + 314 = 422
2. Which equations are related to 672 – 230 = 442? Circle all that apply.
   - A. 230 + 442 = 672
   - B. 672 + 230 = 442
   - C. 672 – 442 = 230
   - D. 442 + 230 = 672

Student Practice Book
17



Lesson 2-9 • Extend Thinking

Use Addition to Subtract

Name _____

The table shows the results of a survey about pet ownership.

Pet Ownership
1 pet - 312 people
2 pets - 501 people
3 pets - 434 people
4 pets - 107 people

1. How many more people own 2 pets than 1 pet? Write both an addition and a subtraction equation.

2. How many more people own 2 pets than 3 pets? Write both an addition and a subtraction equation.

3. Sam uses the survey results to write a third subtraction equation. He uses the related addition equation 312 + ? = 474 to help him find the missing difference. What question is Sam trying to answer? Explain.

4. What is a question you could ask about the number of people who own 4 pets? Write both an addition and a subtraction equation to answer your question.

Differentiation Resource Book
18

Domain

Number and Operations in Base Ten

Standards

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.

SMPs

MPs 2,7

Key Vocabulary

Bar Diagram
Conclude
Comparison

Basic Numeracy Skills

- ☐ Addition
- ☐ Counting Back
- ☐ Subtraction

Notes/Links

Place Value Unit Supporting Activities

Resources

Reveal Platform

Matific Platform

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2-10 Fluently Add within 1,000

Learning Objectives

Students should be able to: Explain different strategies to add 3-digit numbers.

Towards Mastery	Mastery	Beyond Mastery
• **Students can add using partial sum and adjust addend strategies.** **Student Activity:** "Add It Your Way!" **Materials:** Prepared 3-digit addition problems 4-column chart for each student with the following labels: Decompose 1st Addend, 2nd Addend, Both Addends, Adjust Addends **Instructions:** **Review a Sample Problem:** The teacher will review a sample 3-digit addition problem, demonstrating different ways to decompose the numbers. **Present a Problem:** The teacher will give the students a 3-digit addition problem. **Find Different Representations:** Students work individually or in pairs to find as many different ways as they can to represent the problem by decomposing the addends. **Sort into Columns:** Students sort their representations into the appropriate columns on the chart: Decompose 1st Addend: Only the first addend is decomposed. Example: 245 + 132 -> (200 + 40 + 5) + 132Decompose 2nd Addend: Only the second addend is decomposed. Example: 245 + 132 -> 245 + (100 + 30 + 2) Decompose Both Addends: Both addends are decomposed. Example: 245 + 132 -> (200 + 40 + 5) + (100 + 30 + 2)	• **Students can add 3-digit numbers using different strategies.** **Student Activity:** Multi Digit Addition Tic Tac Toe **Instructions:** **Decide Order:** Decide who will go first, second, and third. **Choose Symbols:** Decide who will be X and who will be O. The third player can be a checker or alternate between X and O. **Choose a Box:** The first player chooses a box on the Tic Tac Toe board. **Find the Sum:** The player finds the sum of the addition problem in that box. **Check the Answer:** The "answer keeper" (the third player or a designated player) checks the answer with the answer key. **Mark the Box:** If the player is correct, they draw their X or O in the box. **Take Turns:** Players take turns choosing a box, solving the problem, and marking the box if they are correct. **Win:** The first player to get three in a row (horizontally, vertically, or diagonally) wins. **Play Again:** You may play again with new roles or a new board. **All Materials are available in Game station Book on Reveal Platform Page 34 to 36**	**Students can explain how to add 3-digit numbers using different strategies.** **Student Activity:** "Sum It to Win It!" **Materials:** Prepared Tic Tac Toe board with 3-digit addition problems (see Preparation) Paper and pencil for each player Answer key for the "Answer Keeper" **Instructions :** Create a Tic Tac Toe board with nine 3-digit addition problems. Choose problems that encourage the use of different addition strategies. Create an answer key with the correct sums. **Directions:** **Roles:** Decide Player 1, Player 2, and Answer Keeper. **Symbols:** Player 1 is "X," Player 2 is "O." **Choose Box:** Player 1 chooses a box. **Solve & Explain:** Player 1 solves, explains their strategy, and shows their work. **Check:** Answer Keeper checks the answer and explanation. **Mark/Pass:** If correct, Player 1 marks the box. If incorrect, the box is unmarked, and it's Player 2's turn. **Alternate:** Players 1 and 2 alternate turns. **Win:** First to get three in a row wins, with a correct explanation on the final move.

Domain

Number and Operations in Base Ten

Standards

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.

SMPs

MPs 1,7

Key Vocabulary

Partial Sum
Justify
Process

Basic Numeracy Skills

- ☐ Counting On
- ☐ Place Value
- ☐ Addition

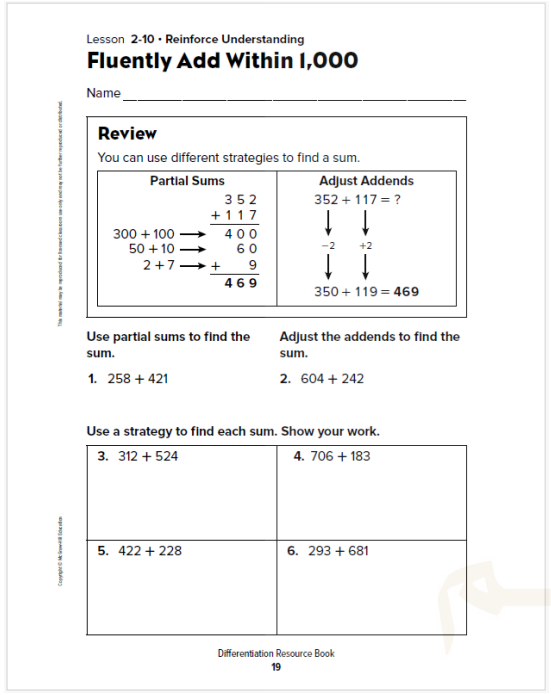
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2-10 Fluently Add within 1,000

Learning Objectives

Students should be able to: Explain different strategies to add 3-digit numbers.

Towards Mastery	Mastery	Beyond Mastery
Adjust Addends: Numbers are added to or subtracted from both addends to make the problem easier. Example: 245 + 132 -> 247 + 130		



Lesson 2-10 • Reinforce Understanding

Fluently Add Within 1,000

Name _____

Review

You can use different strategies to find a sum.

Partial Sums	Adjust Addends
352 + 117	352 + 117 = ?
300 + 100 → 400	↓ −2
50 + 10 → 60	↓ +2
2 + 7 → + 9	350 + 119 = 469
469	

Use partial sums to find the sum.

1. 258 + 421

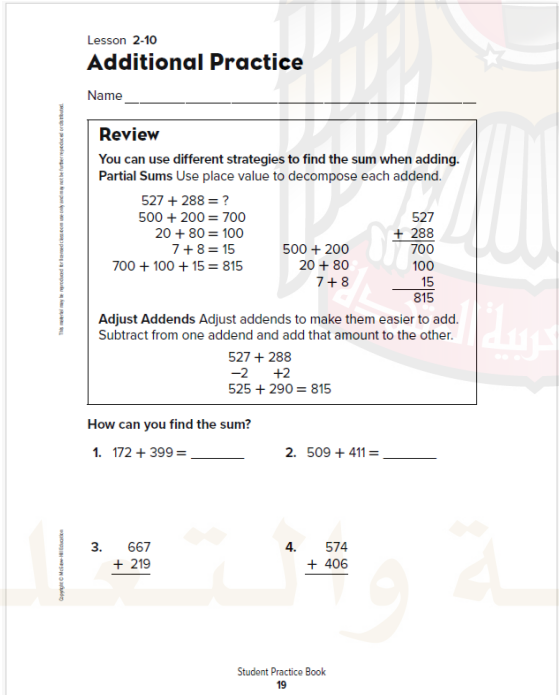
Adjust the addends to find the sum.

2. 604 + 242

Use a strategy to find each sum. Show your work.

3. 312 + 524	4. 706 + 183
5. 422 + 228	6. 293 + 681

Differentiation Resource Book
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Lesson 2-10

Additional Practice

Name _____

Review

You can use different strategies to find the sum when adding.

Partial Sums Use place value to decompose each addend.

527 + 288 = ?
500 + 200 = 700
20 + 80 = 100
7 + 8 = 15
700 + 100 + 15 = 815

500 + 200
20 + 80
7 + 8

527
+ 288
700
100
15
815

Adjust Addends Adjust addends to make them easier to add. Subtract from one addend and add that amount to the other.

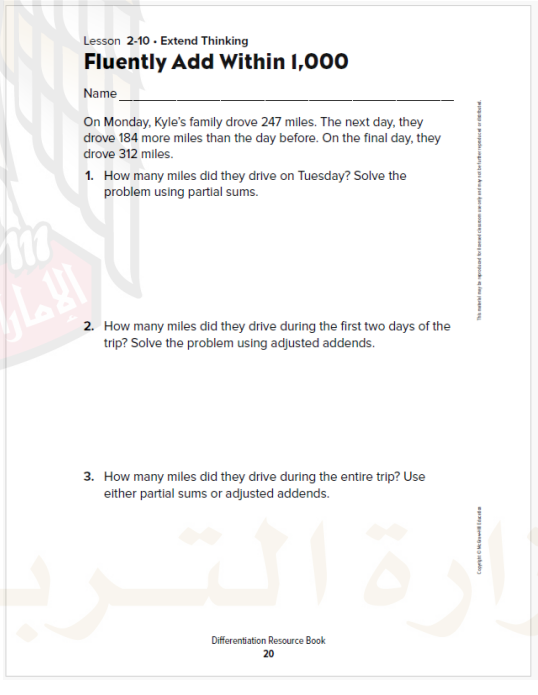
527 + 288
−2 +2
525 + 290 = 815

How can you find the sum?

1. 172 + 399 = _____
2. 509 + 411 = _____

3. 667 + 219
4. 574 + 406

Student Practice Book
19



Lesson 2-10 • Extend Thinking

Fluently Add Within 1,000

Name _____

On Monday, Kyle's family drove 247 miles. The next day, they drove 184 more miles than the day before. On the final day, they drove 312 miles.

1. How many miles did they drive on Tuesday? Solve the problem using partial sums.
2. How many miles did they drive during the first two days of the trip? Solve the problem using adjusted addends.
3. How many miles did they drive during the entire trip? Use either partial sums or adjusted addends.

Differentiation Resource Book
20

Domain

Number and Operations in Base Ten

Standards

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.

SMPs

MPs 1,7

Key Vocabulary

Partial Sum
Justify
Process

Basic Numeracy Skills

- ☐ Counting On
- ☐ Place Value
- ☐ Addition

Notes/Links

Place Value Unit Supporting Activities

Resources

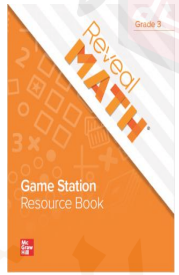
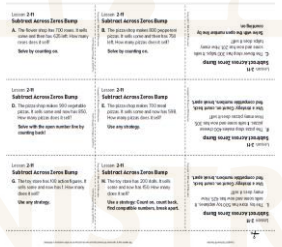
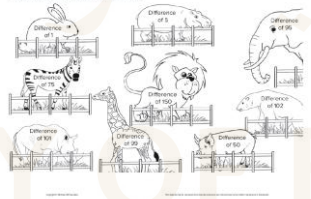
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2-11 Fluently Subtract within 1,000

Learning Objectives
Students should be able to: Explain different strategies to subtract 3-digit numbers.

Towards Mastery	Mastery	Beyond Mastery
• **Students can subtract 3 – digit numbers using decompose one number and adjust numbers strategies.** **Student Activity:** Spin & Subtract: Strategy Switch-Up! **Materials:** A spinner labeled with different subtraction strategies (e.g., number line, base-ten blocks, compensation, counting up) Two number cubes (dice) Paper and pencil for solving and recording **Instructions:** Create a spinner with different subtraction strategies on it. Roll two number cubes four times to get two 2-digit numbers. Write a subtraction equation with them. Spin the spinner to pick a subtraction strategy. Solve your subtraction problem using that strategy. Talk about how you used the strategy. Was it helpful? Would another strategy have been better? Why? Spin again and try a different strategy.	• **Students can subtract 3 - digit numbers using different strategies** **Student Activity:** Subtract Across Zero Pumps • Answer **Subtract Across Zero Pumps** in Game Station Resource Book Pages 25 to 27   	**Students can explain how to subtract 3- digit numbers using different strategies.** **Student Activity:** "Subtract It Your Way!" **Materials:** 3-digit subtraction problem cards Strategy spinner (or list) Answer Key **Instructions:** Create problem cards. Create a strategy spinner/list: Decompose the second addend. Adjust to compatible numbers. Keep first whole, subtract parts of the second. Use a number line Create an answer key. **How to Play:** **Deal:** Place problem cards face down. **Player 1:** Draws a card, solves. **Spin:** Player 1 spins for a strategy. **Explain:** Player 1 explains their solution using the chosen strategy. **Check:** Player 2 checks the answer and explanation. **Points: Correct** answer & explanation: Player 1 gets a point. Incorrect: Player 2 explains, gets a point. **Switch:** Players switch roles. **Win:** Most points win.

Domain
Number and Operations in Base Ten

Standards
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.

SMPs
MPs 1,8

Key Vocabulary
Decompose
Justify
Response

Basic Numeracy Skills

- ☐ Count Back
- ☐ Place Value
- ☐ Subtract

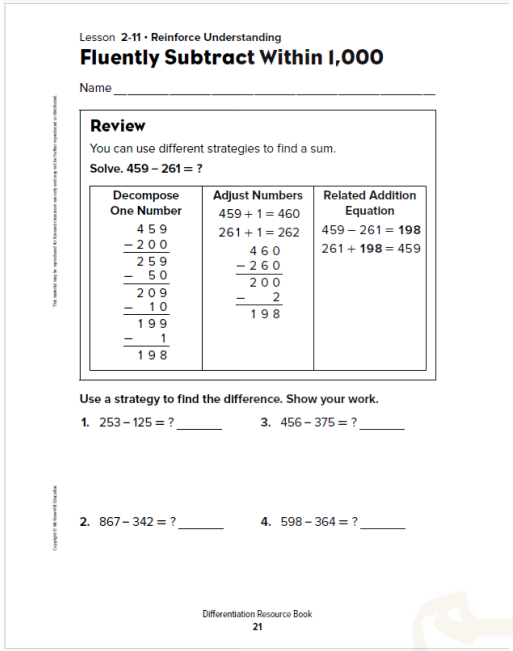
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2-11 Fluently Subtract within 1,000

Learning Objectives

Students should be able to: Explain different strategies to subtract 3-digit numbers.

Towards Mastery	Mastery	Beyond Mastery



Lesson 2-11 • Reinforce Understanding

Fluently Subtract Within 1,000

Name _____

Review

You can use different strategies to find a sum.

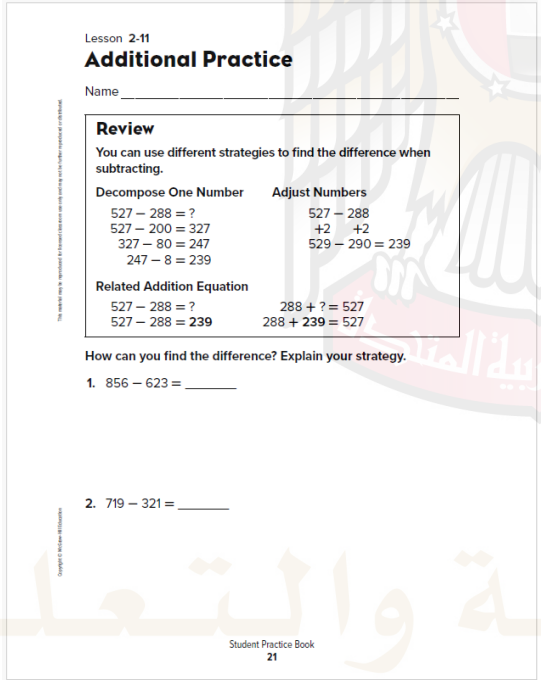
Solve. 459 – 261 = ?

Decompose One Number	Adjust Numbers	Related Addition Equation
459 −200 259 −50 209 −10 199 −1 198	459 + 1 = 460 261 + 1 = 262 460 −260 200 −2 198	459 – 261 = **198** 261 + **198** = 459

Use a strategy to find the difference. Show your work.

1. 253 – 125 = ? _____
3. 456 – 375 = ? _____
2. 867 – 342 = ? _____
4. 598 – 364 = ? _____

Differentiation Resource Book
21



Lesson 2-11

Additional Practice

Name _____

Review

You can use different strategies to find the difference when subtracting.

Decompose One Number

527 – 288 = ?
527 – 200 = 327
327 – 80 = 247
247 – 8 = 239

Adjust Numbers

527 – 288
+2 +2
529 – 290 = 239

Related Addition Equation

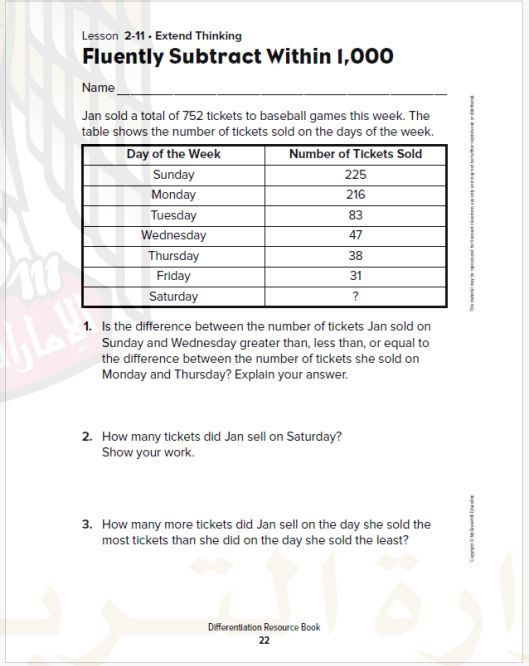
527 – 288 = ?
527 – 288 = **239**
288 + ? = 527
288 + **239** = 527

How can you find the difference? Explain your strategy.

1. 856 – 623 = _____

2. 719 – 321 = _____

Student Practice Book
21



Lesson 2-11 • Extend Thinking

Fluently Subtract Within 1,000

Name _____

Jan sold a total of 752 tickets to baseball games this week. The table shows the number of tickets sold on the days of the week.

Day of the Week	Number of Tickets Sold
Sunday	225
Monday	216
Tuesday	83
Wednesday	47
Thursday	38
Friday	31
Saturday	?

1. Is the difference between the number of tickets Jan sold on Sunday and Wednesday greater than, less than, or equal to the difference between the number of tickets she sold on Monday and Thursday? Explain your answer.

2. How many tickets did Jan sell on Saturday? Show your work.

3. How many more tickets did Jan sell on the day she sold the most tickets than she did on the day she sold the least?

Differentiation Resource Book
22

Domain

Number and Operations in Base Ten

Standards

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.

SMPs

MPs 1,8

Key Vocabulary

Decompose
Justify
Response

Basic Numeracy Skills

- Count Back
- Place Value
- Subtract

Notes/Links

Place Value Unit Supporting Activities

Resources

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2-12 Solve Two-Step Problems Involving Addition and Subtraction

Learning Objectives

Students should be able to:

- Write and solve equations to represent a two-step problem.
- Use letters for unknowns.

Towards Mastery	Mastery	Beyond Mastery
• **Students can decompose the problem into 2 equations .** 🔢 **Student Activity:** "Math Story Detective" 📝**Instructions:** **Read the Problem:** The teacher reads aloud a short story problem.  *Example*: "Lana has 25 apples. She buys 12 more. Then she gives 10 to her friends. How many apples does she have now?" **Think in Steps:** Ask: "What happens first? What happens next?" Step 1: Add the apples she bought → 25 + 12 Step 2: Subtract the apples she gave away → (25 + 12) – 10 **Write the Equations:** First Equation: 25 + 12 = 37 Second Equation: 37 – 10 = 27 **Solve:** Students solve both equations to find the final answer. **Pair Share:** Turn and talk: "Did you do the steps in the same order? How did your equations help you understand the story?"	• **Students can write and solve equations to represent a two-step problem** 🔢 **Student Activity:** Multi Step Addition or Subtraction Race 📝 **Instructions:** **Game Setup:** Create board, cards, provide pieces. **Start:** Roll number cube, highest goes first. **Gameplay**: Players take turns. On your turn: Pick a card with a math problem. Solve the problem on the card. Have another player (or a designated "answer keeper") check your answer using the answer key. If you're correct, move your game piece forward. The card might tell you how many spaces to move, or it might be a set number. If you're wrong, you might have to move your game piece backward. The game continues until someone reaches the end of the game board. • **All Materials are available in Game station Book on Reveal Platform Page 44 to 48**	• **Students can fluently and accurately write and solve equations to represent a two-step problem** 🔢 **Student Activity:** "Roll, Solve, Win!" 🟥 **Materials:** Set of two-step word problem cards Number cube (1-6)  📝 **Instructions:** Prepare cards with two-step word problems. Provide game pieces for each player. **Start: Players** roll the number cube. Highest roller goes first. **Gameplay: Players** take turns. On a turn, a player picks a card. **Write an Equation:** The player writes an equation that represents the word problem. **Solve the Equation:** The player solves the equation. **Check Answer and Equation:** The answer keeper checks both the equation and the solution. **Move:** If correct, the player moves their game piece. If incorrect, the player does not move. **Win: The** first player to reach the Finish

Domain

Operations and Algebraic Thinking

Standards

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.

SMPs

MPs 1,4

Key Vocabulary

Bar Diagram
Unknown
Identify
Process

Basic Numeracy Skills

☐ Addition

☐ Subtraction

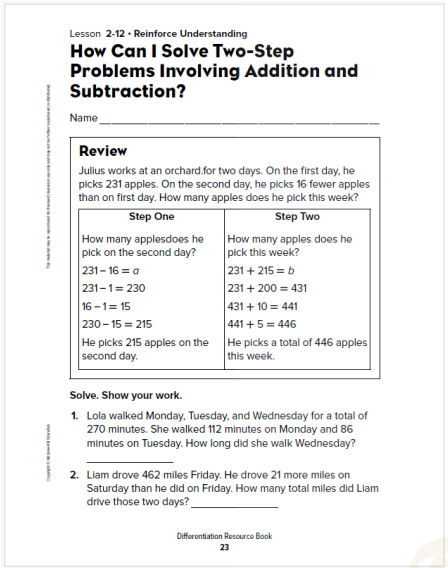
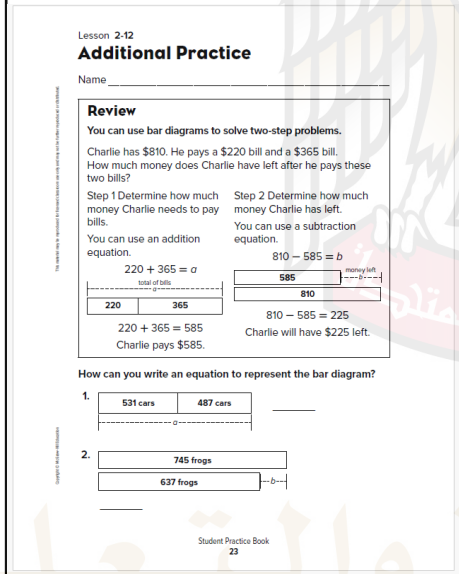
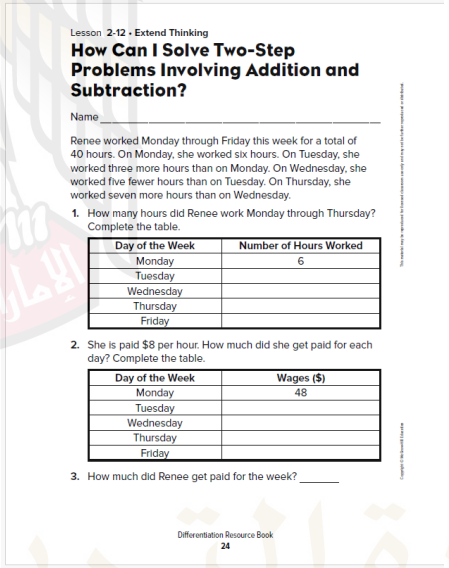
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2-12 Solve Two-Step Problems Involving Addition and Subtraction

Learning Objectives

Students should be able to:

- Write and solve equations to represent a two-step problem.
- Use letters for unknowns.

Towards Mastery	Mastery	Beyond Mastery
		

Lesson 2-12 • Reinforce Understanding

How Can I Solve Two-Step Problems Involving Addition and Subtraction?

Name _____

Review

Julius works at an orchard.for two days. On the first day, he picks 231 apples. On the second day, he picks 16 fewer apples than on first day. How many apples does he pick this week?

Step One	Step Two
How many applesdoes he pick on the second day?	How many apples does he pick this week?
$231 - 16 = a$	$231 + 215 = b$
$231 - 1 = 230$	$231 + 200 = 431$
$16 - 1 = 15$	$431 + 10 = 441$
$230 - 15 = 215$	$441 + 5 = 446$
He picks 215 apples on the second day.	He picks a total of 446 apples this week.

Solve. Show your work.

1. Lola walked Monday, Tuesday, and Wednesday for a total of 270 minutes. She walked 112 minutes on Monday and 86 minutes on Tuesday. How long did she walk Wednesday?

2. Liam drove 462 miles Friday. He drove 21 more miles on Saturday than he did on Friday. How many total miles did Liam drive those two days? _____

Differentiation Resource Book 23

Lesson 2-12

Additional Practice

Name _____

Review

You can use bar diagrams to solve two-step problems.

Charlie has $810. He pays a $220 bill and a $365 bill. How much money does Charlie have left after he pays these two bills?

Step 1 Determine how much money Charlie needs to pay bills.

You can use an addition equation.

$220 + 365 = a$

total of bills: a | 220 | 365

$220 + 365 = 585$

Charlie pays $585.

Step 2 Determine how much money Charlie has left.

You can use a subtraction equation.

$810 - 585 = b$

585 | money left: b

810

$810 - 585 = 225$

Charlie will have $225 left.

How can you write an equation to represent the bar diagram?

1. 531 cars | 487 cars; a _____

2. 745 frogs; 637 frogs; b _____

Student Practice Book 23

Lesson 2-12 • Extend Thinking

How Can I Solve Two-Step Problems Involving Addition and Subtraction?

Name _____

Renee worked Monday through Friday this week for a total of 40 hours. On Monday, she worked six hours. On Tuesday, she worked three more hours than on Monday. On Wednesday, she worked five fewer hours than on Tuesday. On Thursday, she worked seven more hours than on Wednesday.

1. How many hours did Renee work Monday through Thursday? Complete the table.

Day of the Week	Number of Hours Worked
Monday	6
Tuesday	
Wednesday	
Thursday	
Friday	

2. She is paid $8 per hour. How much did she get paid for each day? Complete the table.

Day of the Week	Wages ($)
Monday	48
Tuesday	
Wednesday	
Thursday	
Friday	

3. How much did Renee get paid for the week? _____

Differentiation Resource Book 24

Domain

Operations and Algebraic Thinking

Standards

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.

SMPs

MPs 1,4

Key Vocabulary

Bar Diagram
Unknown
Identify
Process

Notes/Links

Place Value Unit_Supporting Activities

Resources

Reveal Platform

Matific Platform

Basic Numeracy Skills

- ☐ Addition
- ☐ Subtraction

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Multiplication & Division

Notes & Guidance

In this unit, students focus on developing a deep understanding of multiplication and division by exploring a variety of representations. Students build their comprehension through visual models of equal groups and real-life contexts, beginning with concrete tools such as real objects and manipulatives. Gradually, they transition to abstract representations using numbers and symbols. Throughout the unit, students learn to analyze situations to determine whether multiplication or division is appropriate, and they gain insight into how the two operations are interconnected as inverse processes..

Game Station Book Is available in Reveal Platform and will be attached to the CCG File

Pedagogy

- **Concrete-Pictorial-Abstract (CPA)**
- **Math Games and Play-Based Learning**
- **Visual Aids and Anchor Charts**
- **Scaffolded Instruction**:
- **Use of Real-World Contexts**:

Overall Focus

- Encourage **strategic flexibility** rather than rote memorization.
- Prioritize **conceptual understanding** over procedural fluency initially.
- Promote **student discourse** and **justification of reasoning**.

Key Skills & Learning Goals

Conceptual Understanding:
- Identify and model equal groups.
- Recognize situations involving multiplication vs. division.
- Understand the relationship between the two operations.

Procedural Skills:
- Use repeated addition to solve multiplication problems.
- Use arrays to solve both multiplication and division problems.
- Write and interpret multiplication and division equations.

Problem Solving & Reasoning:
- Translate real-life scenarios into mathematical operations.
- Choose appropriate strategies (manipulatives, drawings, equations) to represent and solve problems.

International Assessment Links

Relate Multiplication and Division

IEA TIMSS

Aligned with the Number content domain and the Knowing and Applying cognitive domains, TIMSS emphasizes understanding multiplication and division as inverse operations. Fact families help students make these connections, supporting fluency and logical problem solving through tasks like completing number sentences or solving for missing values.

Understanding Division as Equal Sharing and Grouping

PISA

Aligned with Quantity in the PISA framework, this topic supports reasoning and contextual modeling. Understanding division as sharing or grouping prepares students to solve real-world problems such as distributing resources, organizing items, or calculating unit costs—where interpreting division structure is essential to decision-making and quantitative reasoning.

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Unit 3 – Multiplication & Division
Learning Objectives & Criteria

Unit Goal:
Use different representations to show multiplication and division situations.

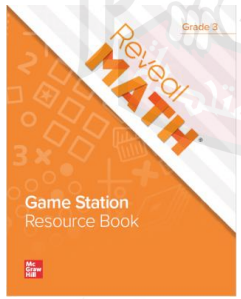
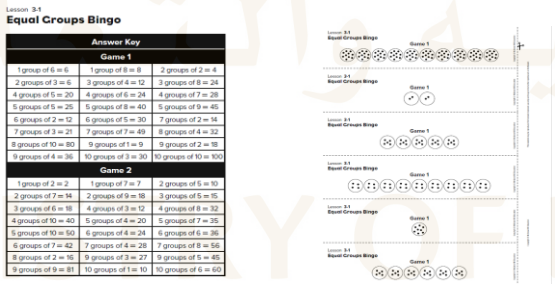
Learning Objective (LO)	Common Core State Standard	Formative Assessment Criteria
• Explain the meaning of multiplication as equal groups.	◆ 3.OA.A.1 Interpret products of whole numbers, e.g., interpret 5 × 7 as the total number of objects in 5 groups of 7 objects each. For example, describe a context in which a total number of objects can be expressed as 5 × 7	• What does it mean to multiply using equal groups? Can you give an example?
• Use arrays to represent multiplication.		• Can you draw an array to show 3 × 4? How many rows and columns will you have?
• Demonstrate an understanding of the Commutative Property of Multiplication.	◆ 3.OA.B.5 Apply properties of operations as strategies to multiply. (Commutative property of multiplication.) 3 × 5 × 2 can be found by 3 × 5 = 15, then 15 × 2 = 30, or by 5 × 2 = 10, then 3 × 10 = 30.	• Can you show two multiplication equations that have the same product, but the numbers are in a different order?.
• Represent division with equal sharing.	◆ 3.OA.A.2 Interpret whole-number quotients of whole numbers, e.g., interpret 56 ÷ 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. For example, describe a context in which a number of shares or a number of groups can be expressed as 56 ÷ 8.	• Can you draw a picture to show how 15 cookies can be shared equally among 5 children?
• Represent division with equal grouping.		• If you have 15 stickers and you want to make groups of 3, how many groups can you make? • Use blocks or counters to show how 16 can be grouped into sets of 4. How many groups did you make?
• Use equal groups and arrays to represent the relationship between multiplication and division.	◆ 3.OA.A.1. ◆ 3.OA.A.2	• Show how 20 ÷ 5 = 4 can also be seen as a multiplication equation using equal groups.
• Use representations to determine the unknown in a multiplication or division equation.	◆ 3.OA.A.4 Determine the unknown whole number in a multiplication or division equation relating three whole numbers	• Use counters to model this equation: ___ × 6 = 36. How did the representation help you find the unknown factor?

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3-1 Understand Equal Groups

Learning Objectives

Students should be able to: Explain the meaning of multiplication as equal groups.

Towards Mastery	Mastery	Beyond Mastery
• **Students can link between number of groups and the equal number of elements inside each group.** **Student Activity**: How Many Xs? **Materials:** Two number cubes (dice) per pair Pencil and paper Crayons or markers (optional) **Instructions:** **Partner Up:** Work with a classmate. Decide who will go first. **Roll and Draw:** Player 1 rolls a number cube and draws that number of circles on their paper. Player 2 rolls a number cube and draws that many Xs inside **each** circle. **Count and Record:** Count the total number of Xs. Write a multiplication sentence to match (e.g., 3 circles × 4 Xs = 12 Xs). **Repeat:** Play for 3–5 rounds.Each round, record the multiplication sentence and total.	• **Students can explain the meaning of multiplication as equal groups.** **Student Activity:** Equal Group Bingo • Answer **Equal Group Bingo** in Game Station Resource Book Pages 49 to 60  	• **Students can accurately and fluently explain the meaning of multiplication as equal groups.** **Student Activity:** Equal Groups Mystery Challenge" **Instructions for Students:** **Choose a Card:** Each student selects or is given a **"mystery card"** showing only a **total number** (e.g., 24, 36, or 48). **Create Equal Groups:** Using counters, cubes, or drawings, create **at least 2 different equal group models** to show how that number can be represented. Example for 24: 4 groups of 6 6 groups of 4 3 groups of 8  **Write and Explain:** Write a multiplication equation for each model. Explain **why** your groupings are equal. Use vocabulary like *groups of*, *each*, *total*, *same number*, etc. **Stretch Task (Beyond Mastery Focus):** Challenge: Can you show **more than two different ways** to group the number? Can you explain **why some numbers have more groupings than others**?

Domain

Operations and Algebraic Thinking

Standards

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.*

SMPs

MPs 4,6

Key Vocabulary

Equal Groups
Multiplication
Create
Determine

Basic Numeracy Skills

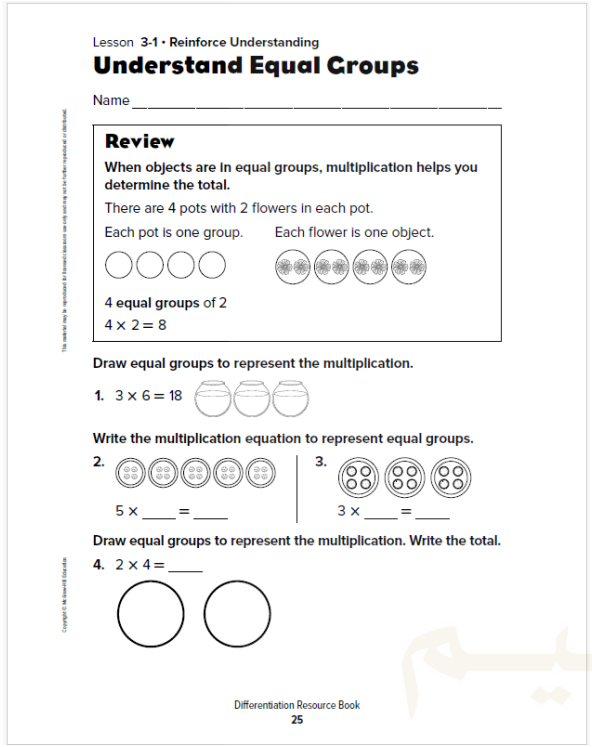
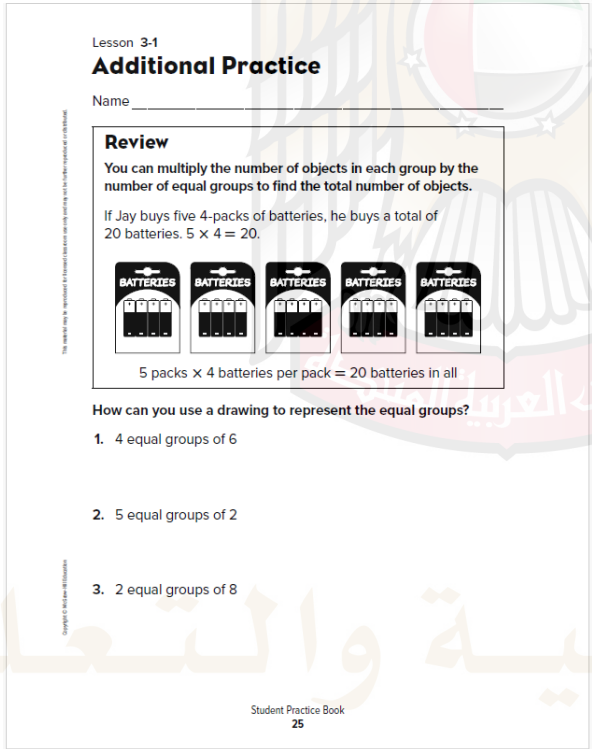
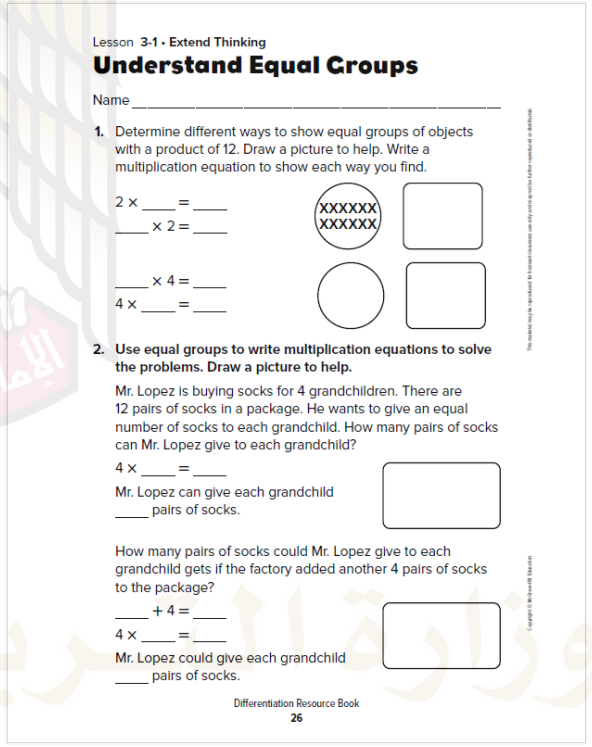
- ☐ Addition
- ☐ Subtraction
- ☐ Multiplication

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3-1 Understand Equal Groups

Learning Objectives

Students should be able to: Explain the meaning of multiplication as equal groups.

Towards Mastery	Mastery	Beyond Mastery
		

Domain

Operations and Algebraic Thinking

Standards

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.*

SMPs

MPs 4,6

Key Vocabulary

Equal Groups
Multiplication
Create
Determine

Basic Numeracy Skills

- ☐ Addition
- ☐ Subtraction
- ☐ Multiplication

Notes/Links

White Rose Education Resources

Resources

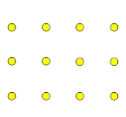
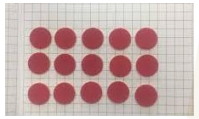
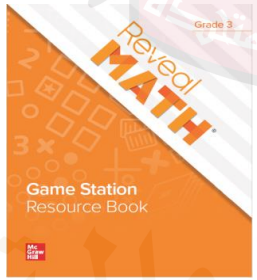
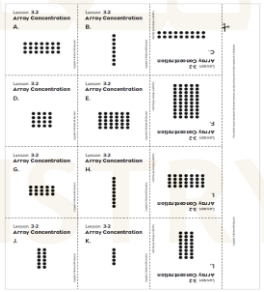
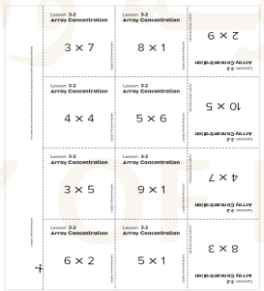
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3-2 Use Arrays to Multiply

Learning Objectives

Students should be able to: Use arrays to represent multiplication.

Towards Mastery	Mastery	Beyond Mastery
• **Students can link between number of Rows and the equal number of elements inside each Row.** 🔢 **Student Activity:** How Many Desks? 📝 **Instructions for Students:** **Create a Desk Arrangement:** Choose two **single-digit numbers** and complete this sentence: ✏️ *"Mrs. Carter is arranging desks in her classroom. She arranges the desks in ___ rows with ___ desks in each row."* **Build Your Array:** Use counters, cubes, or draw dots to make your rows and columns. Arrange them neatly to form a **rectangle (array)**. **Write Equations:** Write a **repeated addition sentence** (e.g., 5 + 5 + 5 = 15). Write a **multiplication equation** (e.g., 3 × 5 = 15). **Share and Repeat:** Show your partner or group how you solved it.  	• **Students can use arrays to represent multiplication.** 🔢 **Student Activity:** Array Concentration • Answer **Array Concentration** in Game Station Resource Book Pages 61 to 63   	**Students can use arrays to represent multiplication in the real-life applications.** 🔢 **Student Activity:** "Array Architect Challenge" 📝 **Instructions for Students:** You are an **Array Architect**! You will design a building made up of windows arranged in rows and columns. But there's a twist—there must be **more than one way** to represent the same total number of windows using arrays. **Choose a Total Number:** Pick a number between **24 and 48** (or teacher assigns a number). **Create Different Arrays:** Using graph paper, cubes, or drawings, represent that number in **at least two different array formations**. 📦 Example for 36: 6 rows × 6 windows 4 rows × 9 windows **Explain Your Thinking:** For each array: Write the multiplication equation. Write the matching repeated addition sentence. **Extension (Beyond Mastery):** Find **all possible array combinations** for your number.

Domain

Operations and Algebraic Thinking

Standards

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.*

SMPs

MPs 4,7

Key Vocabulary

Array
Factor
Product
Represent

Basic Numeracy Skills

- ☐ Addition
- ☐ Subtraction
- ☐ Multiplication

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3-2 Use Arrays to Multiply

Learning Objectives

Students should be able to: Use arrays to represent multiplication.

Towards Mastery	Mastery	Beyond Mastery

Lesson 3-2 • Reinforce Understanding

Use Arrays to Multiply

Name _____

Review

Arrays represent multiplication equations showing equal groups.



2 equal groups of 3

2 × 3 = 6

factors product

Draw the array that represents the multiplication equation. Circle the factors.

1. 4 × 3 = 12

2. 6 × 3 = 18

Write the multiplication equation that the array represents and solve.

3. 

3 × ____ = ____

4. 

____ × 5 = ____

Differentiation Resource Book

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Lesson 3-2

Additional Practice

Name _____

Review

An array has rows of equal groups. To find the total number of objects in an array, you can multiply the number of columns by the number of rows.

The array has 4 rows and 3 columns. The total number of objects is 4 × 3 = 12.



What multiplication equation represents the array?

1. 

2. 

3. 

4. 

Student Practice Book

27

Lesson 3-2 • Extend Thinking

Use Arrays to Multiply

Name _____

1. Mr. Grabach is building rectangles with 10 tiles. Draw all the possible arrays that he could make with his tiles. Complete the multiplication equation for each array.

1 × ____ = ____	____ × 1 = ____
____ × 5 = ____	5 × ____ = ____

2. Calvin needs 9 jerseys for each of the 6 teams in his baseball league. How many jerseys does Calvin need to order?

Draw an array. Write the multiplication equation and solve.

9 × ____ = ____

Differentiation Resource Book

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Domain

Operations and Algebraic Thinking

Standards

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.*

SMPs

MPs 4,7

Key Vocabulary

Array
Factor
Product
Represent

Basic Numeracy Skills

- ☐ Addition
- ☐ Subtraction
- ☐ Multiplication

Notes/Links

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Resources

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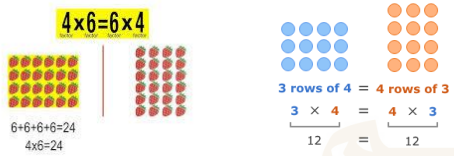
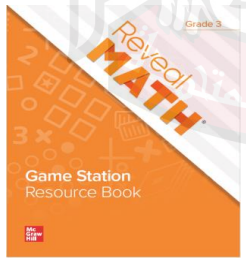
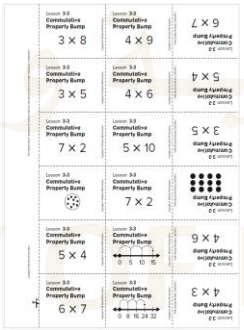
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3-3 Understand the Commutative Property

Learning Objectives

Students should be able to: Demonstrate an understanding of the Commutative Property of Multiplication.

Towards Mastery	Mastery	Beyond Mastery
• **Students will recognize that flipping factors will not change the product answer.** **Student Activity:** "Flip & Multiply!" **Instructions for Students:** **Roll and Write:** Roll two number cubes (dice). Write a multiplication sentence using the numbers in the order you rolled them. Example: If you roll 2 and 5, write **2 × 5 = 10**. **Flip It:** Now flip the order of the numbers and write a new sentence. Example: **5 × 2 = 10**  **C** Are the answers the same? ✔ Circle both answers and write: *"Same product!"* **Repeat:** Play 3–5 rounds. Each time, flip and compare. **Reflect (Optional Writing Task):** Finish this sentence: *"In multiplication, when I flip the numbers, the answer still stays the same because..."*	• **Students can demonstrate an understanding of the Commutative Property of Multiplication** **Student Activity:** Commutative Property Bump • Answer **Commutative Property Bump** in Game Station Resource Book Pages 64 to 68   	• **Students can demonstrate and explain the Commutative Property of Multiplication.** **Student Activity:** "Same Product, New View!" **Instructions for Students:** Choose two numbers between 1 and 10 (e.g., 3 and 4). Use cubes, counters, or draw arrays to show 3 rows of 4 (3 × 4) **Compare and Explain:** Are the totals the same? How are the arrays the same? How are they different? Use math words like *rows, columns, same total, switch, equal groups*. **Create a Commutative Property Poster:** On a blank page, design a mini-poster that includes: Two array models (e.g., 3 × 4 and 4 × 3) Equations and repeated addition sentences that **changing the order of factors does not change the product**. **Challenge (Beyond Mastery Level):** Find **three or more** examples that follow the commutative property. Explain **why** it works every time.

Domain

Operations and Algebraic Thinking

Standards

3.OA.B.5

Apply properties of operations as strategies to multiply and divide

SMPs

MPs 7

Key Vocabulary

Array
Factor
Product
Conclude

Basic Numeracy Skills

- ☐ Addition
- ☐ Multiplication

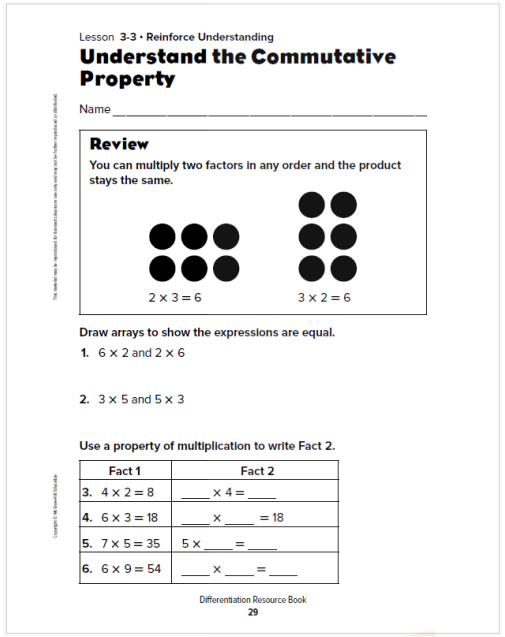
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3-3 Understand the Commutative Property

Learning Objectives

Students should be able to: Demonstrate an understanding of the Commutative Property of Multiplication.

Towards Mastery	Mastery	Beyond Mastery



Lesson 3-3 • Reinforce Understanding

Understand the Commutative Property

Name _____

Review

You can multiply two factors in any order and the product stays the same.

2 × 3 = 6 3 × 2 = 6

Draw arrays to show the expressions are equal.

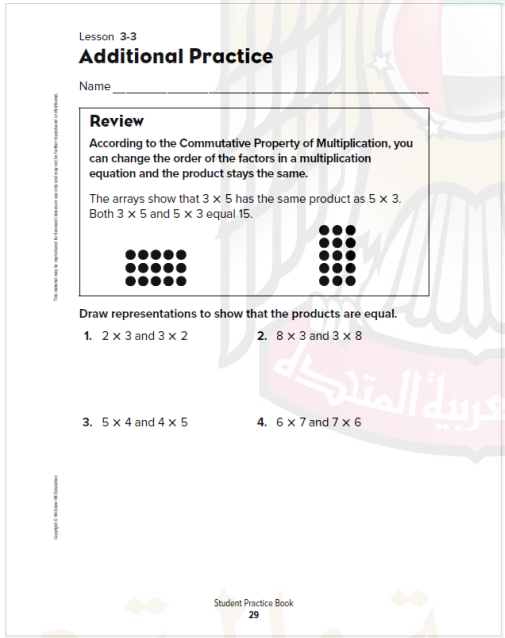
1. 6 × 2 and 2 × 6

2. 3 × 5 and 5 × 3

Use a property of multiplication to write Fact 2.

Fact 1	Fact 2
3. 4 × 2 = 8	____ × 4 = ____
4. 6 × 3 = 18	____ × ____ = 18
5. 7 × 5 = 35	5 × ____ = ____
6. 6 × 9 = 54	____ × ____ = ____

Differentiation Resource Book
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Lesson 3-3

Additional Practice

Name _____

Review

According to the Commutative Property of Multiplication, you can change the order of the factors in a multiplication equation and the product stays the same.

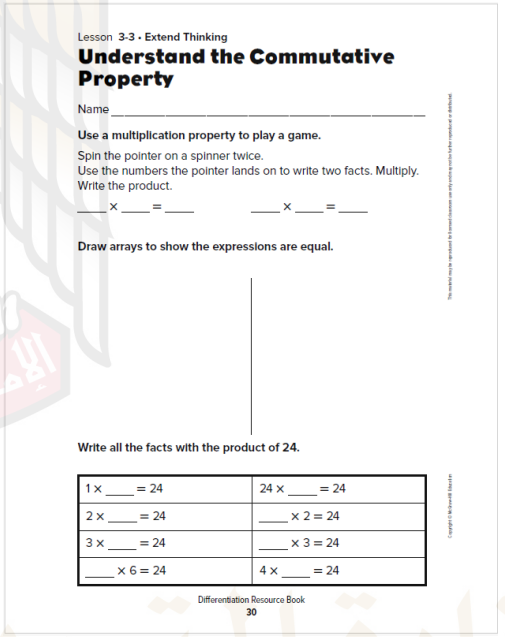
The arrays show that 3 × 5 has the same product as 5 × 3. Both 3 × 5 and 5 × 3 equal 15.

Draw representations to show that the products are equal.

1. 2 × 3 and 3 × 2 2. 8 × 3 and 3 × 8

3. 5 × 4 and 4 × 5 4. 6 × 7 and 7 × 6

Student Practice Book
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Lesson 3-3 • Extend Thinking

Understand the Commutative Property

Name _____

Use a multiplication property to play a game.

Spin the pointer on a spinner twice.
Use the numbers the pointer lands on to write two facts. Multiply. Write the product.

____ × ____ = ____ ____ × ____ = ____

Draw arrays to show the expressions are equal.

Write all the facts with the product of 24.

1 × ____ = 24	24 × ____ = 24
2 × ____ = 24	____ × 2 = 24
3 × ____ = 24	____ × 3 = 24
____ × 6 = 24	4 × ____ = 24

Differentiation Resource Book
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Domain

Operations and Algebraic Thinking

Standards

3.OA.B.5
Apply properties of operations as strategies to multiply and divide

SMPs

MPs 7

Key Vocabulary

Array
Factor
Product
Conclude

Basic Numeracy Skills

- ☐ Addition
- ☐ Multiplication

Notes/Links

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Resources

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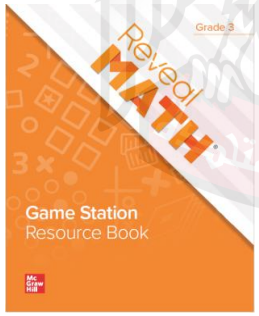
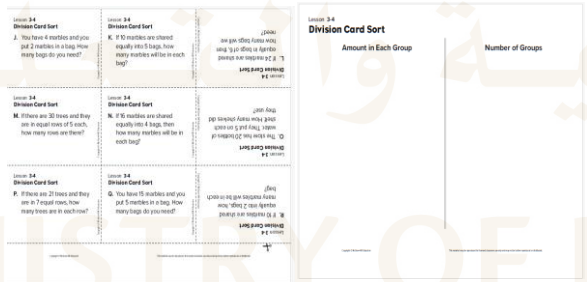
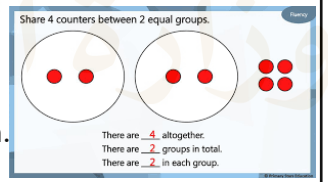
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3-4 Understand Equal Sharing

Learning Objectives
Students should be able to: Represent division with equal sharing.

Towards Mastery	Mastery	Beyond Mastery
• **Students will explore division using real objects, pictures, and simple number sentences.** **Student Activity:** Divide and Show **Materials:** Small manipulatives (e.g., counters, mini-erasers, blocks) Simple worksheet with 2-3 word problems Crayons or pencils **Instructions:** **Read the Problem Together:** The teacher reads the word problem aloud. **Model with Objects:** Students use manipulatives to act it out. *Example: "Share 12 cookies among 3 friends" → Give counters to 3 pretend "friends".* **Draw a Picture:** Students draw what they just did with their counters. **Write a Number Sentence:** Fill in a simple division sentence with blanks: Example: 12 ÷ 3 = ___ **Share Thinking:** Ask a few students to explain how they divided their items. **Worksheet Sample:** Share 10 apples between 2 baskets. Put 15 blocks in groups of 5. How many groups?	• **Students will represent division with equal sharing.** **Student Activity:** Division Card Sort • Answer **Division Card Sort** in Game Station Resource Book Pages 69 to 72  	• **Students will represent and explain division with equal sharing.** **Student Activity:** "Divide and Show!" **Materials:** Manipulatives (e.g., counters, mini-erasers, blocks) Paper Pencils Worksheet with word problems and recording sheets **Instructions:** **Introduction:** Review division as equal sharing. **Group Work:** Divide students into small groups (2-3 students).Provide materials. **Solve Word Problems:** Students solve word problems, and for each problem, they: Use manipulatives to model. Draw a picture. Write a division equation. Explain their reasoning.  **Share and Discuss:** Groups share solutions and discuss how drawings/equations represent equal sharing.

Domain
Operations and Algebraic Thinking

Standards
3.OA.A.2
Interpret whole-number quotients of whole numbers

SMPs
MPs 2,4

Key Vocabulary
Division
Context
Contrast

Basic Numeracy Skills

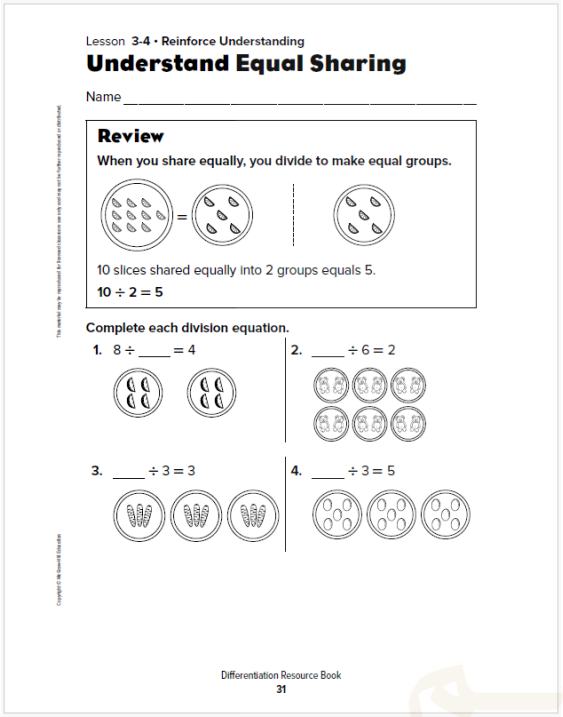
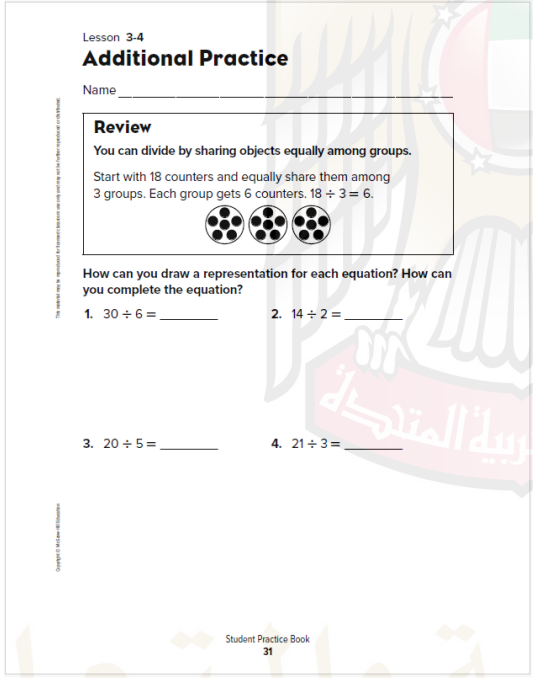
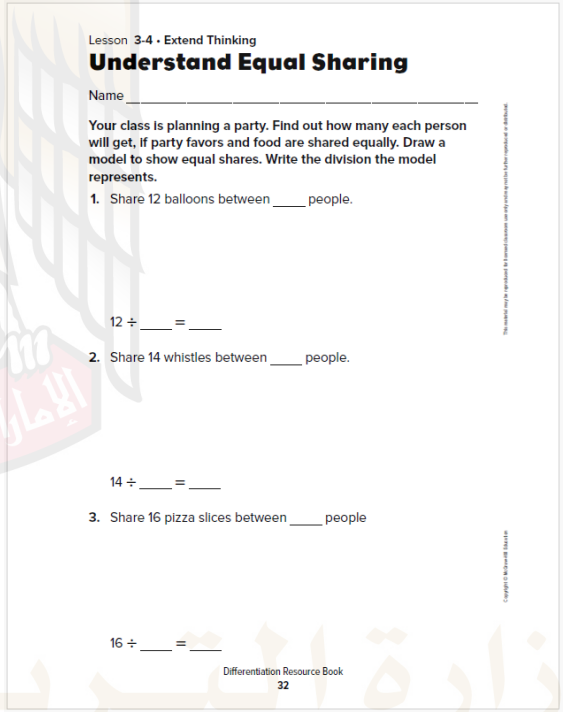
- ☐ Addition
- ☐ Subtraction
- ☐ Multiplication

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3-4 Understand Equal Sharing

Learning Objectives

Students should be able to: Represent division with equal sharing.

Towards Mastery	Mastery	Beyond Mastery
		

Lesson 3-4 · Reinforce Understanding

Understand Equal Sharing

Name _____

Review

When you share equally, you divide to make equal groups.

10 slices shared equally into 2 groups equals 5.

10 ÷ 2 = 5

Complete each division equation.

1. 8 ÷ ____ = 4
2. ____ ÷ 6 = 2
3. ____ ÷ 3 = 3
4. ____ ÷ 3 = 5

Differentiation Resource Book
31

Lesson 3-4

Additional Practice

Name _____

Review

You can divide by sharing objects equally among groups.

Start with 18 counters and equally share them among 3 groups. Each group gets 6 counters. 18 ÷ 3 = 6.

How can you draw a representation for each equation? How can you complete the equation?

1. 30 ÷ 6 = _____
2. 14 ÷ 2 = _____
3. 20 ÷ 5 = _____
4. 21 ÷ 3 = _____

Student Practice Book
31

Lesson 3-4 · Extend Thinking

Understand Equal Sharing

Name _____

Your class is planning a party. Find out how many each person will get, if party favors and food are shared equally. Draw a model to show equal shares. Write the division the model represents.

1. Share 12 balloons between ____ people.

12 ÷ ____ = ____

2. Share 14 whistles between ____ people.

14 ÷ ____ = ____

3. Share 16 pizza slices between ____ people

16 ÷ ____ = ____

Differentiation Resource Book
32

Domain

Operations and Algebraic Thinking

Standards

3.OA.A.2

Interpret whole-number quotients of whole numbers,

SMPs

MPs 2,4

Key Vocabulary

Division
Context
Contrast

Basic Numeracy Skills

- ☐ Subtraction
- ☐ Multiplication
- ☐ Division

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MINISTRY OF EDUCATION

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3-5 Understand Equal Grouping

Learning Objectives

Students should be able to: Represent division with equal grouping.

Towards Mastery	Mastery	Beyond Mastery
• **Students will explore division by making equal groups using numbers from 8 to 20.**	• **Students will represent division with equal groups.**	• **Students will explain and represent division with equal groups.**

Student Activity: Group It Up

Materials List:

Number Cards (8–20)

Small Counters or Manipulatives



Instructions:

Pick a Number:

The teacher gives each pair a number card (e.g., 12, 16, or 20).

Make Equal Groups:

One student uses small objects (counters, blocks, or circles) to **show equal groups**.

Example: If the number is **12**, show:

3 groups of 4

4 groups of 3

Write a Division Sentence:

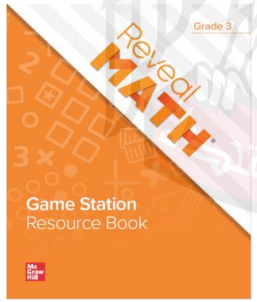
Students write one matching equation (e.g., 12 ÷ 4 = 3).

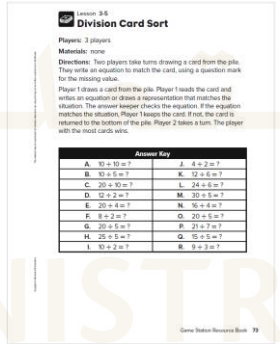
Switch and Repeat:

The other partner now picks a new number and does the same.

Student Activity: Division Card Sort

- Answer **Division Card Sort** in Game Station Resource Book Pages 73 to 75





Lesson 3-5
Division Card Sort

Players: 3 players

Materials: none

Directions: Two players take turns drawing a card from the pile. They write an equation to match the card, using a question mark for the missing value.

Player 1 draws a card from the pile. Player 1 reads the card and writes an equation or draws a representation that matches the situation. The answer keeper checks the equation. If the equation matches the situation, Player 1 keeps the card. If not, the card is returned to the bottom of the pile. Player 2 takes a turn. The player with the most cards wins.

Answer Key

A.	10 ÷ 10 = ?	J.	4 ÷ 2 = ?
B.	10 ÷ 5 = ?	K.	12 ÷ 6 = ?
C.	20 ÷ 10 = ?	L.	24 ÷ 6 = ?
D.	12 ÷ 2 = ?	M.	30 ÷ 5 = ?
E.	20 ÷ 4 = ?	N.	16 ÷ 4 = ?
F.	8 ÷ 2 = ?	O.	20 ÷ 5 = ?
G.	20 ÷ 5 = ?	P.	21 ÷ 7 = ?
H.	25 ÷ 5 = ?	Q.	15 ÷ 5 = ?
I.	10 ÷ 2 = ?	R.	9 ÷ 3 = ?

Game Station Resource Book 73



Student Activity:

"Division Detective: The Grouping Mystery"

Instructions:

Pick a Mystery Number: Choose or receive a mystery number (between 20 and 60). This number represents a total number of students, marbles, or objects.

Find ALL Possible Groupings: Using counters, cubes, or drawings, Show all the different ways to divide that number into equal groups (no leftovers).For each, draw a visual model (like equal circles with counters inside).Write a division equation to match (e.g., 24 ÷ 4 = 6).

Record in a Table: Make a table like this to organize your findings:

Total Objects	Group Size	Number of Groups
24	6	4
24	2	12

Explain Your Reasoning: On the back, answer: "How do you know when a number can be divided evenly? "What do your groupings tell you about the number? "Detective Bonus

(Beyond Mastery Task): Find a number that has the most equal groupings (most factors).Explain how this connects to factors and multiplication. Can you find a number with only one way to group equally?

Domain

Operations and Algebraic Thinking

Standards

3.OA.A.2

Interpret whole-number quotients of whole numbers

SMPs

MPs 4,7

Key Vocabulary

Dividend

Divisor

Quotient

Compare

Context

Basic Numeracy Skills

- ☐ Subtraction
- ☐ Multiplication
- ☐ Division

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3-5 Understand Equal Grouping

Learning Objectives

Students should be able to: Represent division with equal grouping.

Towards Mastery	Mastery	Beyond Mastery

Lesson 3-5 • Reinforce Understanding

Understand Equal Grouping

Name _____

Review

Division can represent equal grouping.

These service dogs will visit people in groups of 2. How many groups?



Put the dogs in groups of 2.



3 **equal groups** of 2

6 ÷ 3 = 2

Draw and write the equal groups. Complete the division.

1. 8 flowers
   2 flowers for each person
   How many people?
   ____ **equal groups** of 2
   8 ÷ 2 = ____

2. 10 goldfish
   5 goldfish in each pond
   How many ponds?
   ____ **equal groups** of 5
   10 ÷ 5 = ____

Lesson 3-5

Additional Practice

Name _____

Review

You can divide by separating objects into groups of equal size.

Create equal groups of 8 until you reach a total of 24. The representation shows that there are 3 groups of 8 in 24, so 24 ÷ 8 = 3.



What division equation represents the equal grouping?

1. 

2. 

3. 

4. 

Lesson 3-5 • Extend Thinking

Understand Equal Grouping

Name _____

Find the quotient for each expression. Write a problem for each equation in which equal groups can be expressed.

1. 25 ÷ 5 = ____
2. 63 ÷ 7 = ____
3. 18 ÷ 9 = ____
4. 30 ÷ 6 = ____

Domain

Operations and Algebraic Thinking

Standards

3.OA.A.2

Interpret whole-number quotients of whole numbers

SMPs

MPs 4,7

Key Vocabulary

Dividend
Divisor
Quotient
Compare
Context

Basic Numeracy Skills

- ☐ Subtraction
- ☐ Multiplication
- ☐ Division

Notes/Links

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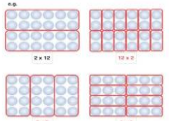
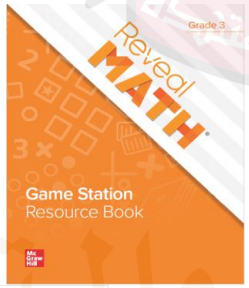
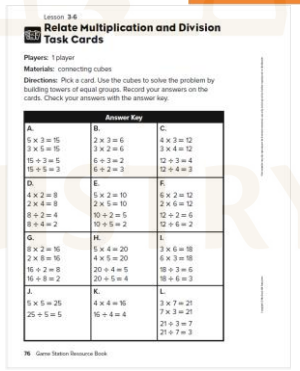
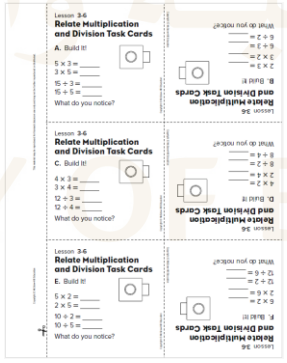
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3-6 Relate Multiplication and Division

Learning Objectives

Students should be able to: Use equal groups and arrays to represent the relationship between multiplication and division.

Towards Mastery	Mastery	Beyond Mastery
• **Students can draw equal groups of arrays and write equation.** **Student Activity:** "Fact Family Builders" **Instructions for Students:** **Get into Small Groups:** Work in a group of 3–4 students. **Draw Equal Groups or Arrays:** One student draws a picture that shows equal groups (e.g., 3 groups of 4) **or** An array (e.g., 3 rows of 4)  **Write the Equations:** The group works together to write: A multiplication sentence (e.g., 3 × 4 = 12) A division sentence (e.g., 12 ÷ 4 = 3)  **Explain the Connection:** Talk about how the two equations are related. Think about: What is the total? What is being grouped? How are multiplication and division opposites? **Switch Roles and Repeat:** Another student in the group draws a new model, and the process starts again.	• **Students can use equal groups and arrays to represent the relationship between multiplication and division.** **Student Activity**: Relate Multiplication and Division Task Cards • Answer **Relate Multiplication and Division Task Cards** in Game Station Resource Book Pages 76 to 78   	• **Students can use equal groups and arrays to represent and explain the relationship between multiplication and division** **Student Activity:** "Math Fact Factory Challenge" **Instructions for Students:** **Build Your Factory (Draw an Array):** Choose any 2 numbers (from 2–10) and create an **array** using grid paper or counters. Example: 4 rows of 5 (array of 4 × 5 = 20) **Produce a Fact Family Set:** From your array, write: **2 multiplication equations** (e.g., 4 × 5 = 20 and 5 × 4 = 20)**2 division equations** (e.g., 20 ÷ 4 = 5 and 20 ÷ 5 = 4) **Model with Equal Groups:** Show the same math fact family using **equal group drawings** (circles with dots inside). Represent the **same total** in different ways (e.g., 5 groups of 4 AND 4 groups of 5). **Explain the Relationship:** Write or record a short explanation answering: "How do multiplication and division connect? "How can one help you solve the other?" **Advanced Challenge – Invent a Problem:** Create a **real-life story problem** that uses the same numbers in your fact family. Example: "There are 4 shelves with 5 books on each. How many books in total?" Then **rewrite it as a division problem**.

Domain
Operations and Algebraic Thinking

Standards
3.OA.A.1
3.OA.A.2
Interpret whole-number quotients of whole numbers

SMPs
MPs 2,7

Key Vocabulary
Array
Division
Equal Groups
Multiplication

Basic Numeracy Skills

- ☐ Subtraction
- ☐ Multiplication
- ☐ Division

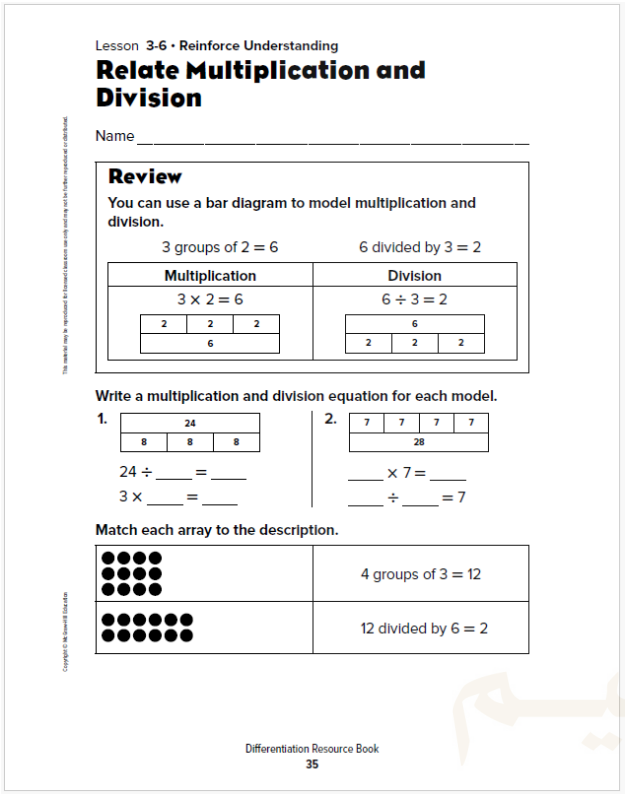
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3-6 Relate Multiplication and Division

Learning Objectives

Students should be able to: Use equal groups and arrays to represent the relationship between multiplication and division.

Towards Mastery	Mastery	Beyond Mastery



Lesson 3-6 • Reinforce Understanding

Relate Multiplication and Division

Name _____

Review

You can use a bar diagram to model multiplication and division.

3 groups of 2 = 6 | 6 divided by 3 = 2

Multiplication	Division
3 × 2 = 6	6 ÷ 3 = 2
2 2 2 / 6	6 / 2 2 2

Write a multiplication and division equation for each model.

1. 24 / 8 8 8

24 ÷ ____ = ____

3 × ____ = ____

2. 7 7 7 7 / 28

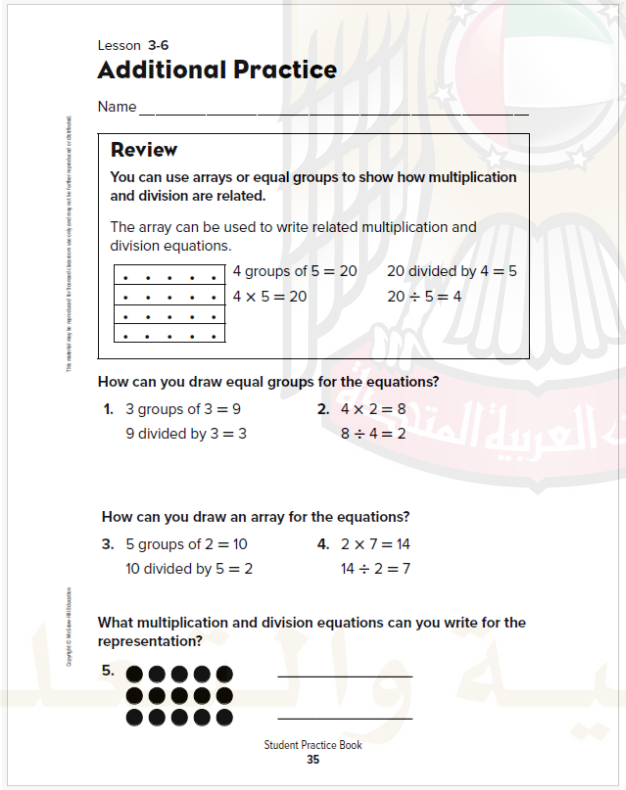
____ × 7 = ____

____ ÷ ____ = 7

Match each array to the description.

●●●● ●●●● ●●●●	4 groups of 3 = 12
●●●●●● ●●●●●●	12 divided by 6 = 2

Differentiation Resource Book
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Lesson 3-6

Additional Practice

Name _____

Review

You can use arrays or equal groups to show how multiplication and division are related.

The array can be used to write related multiplication and division equations.

4 groups of 5 = 20 | 20 divided by 4 = 5

4 × 5 = 20 | 20 ÷ 5 = 4

How can you draw equal groups for the equations?

1. 3 groups of 3 = 9
   9 divided by 3 = 3
2. 4 × 2 = 8
   8 ÷ 4 = 2

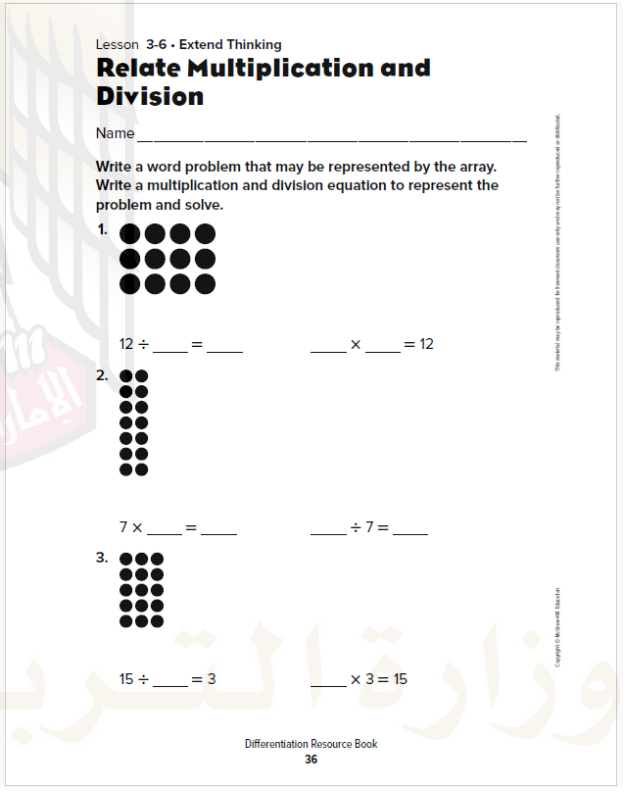
How can you draw an array for the equations?

3. 5 groups of 2 = 10
   10 divided by 5 = 2
4. 2 × 7 = 14
   14 ÷ 2 = 7

What multiplication and division equations can you write for the representation?

5. ●●●●● ●●●●● ●●●●● _____ _____

Student Practice Book
35



Lesson 3-6 • Extend Thinking

Relate Multiplication and Division

Name _____

Write a word problem that may be represented by the array. Write a multiplication and division equation to represent the problem and solve.

1. ●●●● ●●●● ●●●●

12 ÷ ____ = ____ ____ × ____ = 12

2. ●● ●● ●● ●● ●● ●● ●●

7 × ____ = ____ ____ ÷ 7 = ____

3. ●●● ●●● ●●● ●●● ●●● ●●●

15 ÷ ____ = 3 ____ × 3 = 15

Differentiation Resource Book
36

Domain

Operations and Algebraic Thinking

Standards

3.OA.A.1
3.OA.A.2
Interpret whole-number quotients of whole numbers

SMPs

MPs 2,7

Key Vocabulary

Array
Division
Equal Groups
Multiplication

Basic Numeracy Skills

- ☐ Subtraction
- ☐ Multiplication
- ☐ Division

Notes/Links

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3-7 Find the Unknown

Learning Objectives

Students should be able to: Use representations to determine the unknown in a multiplication or division equation.

Towards Mastery

- **Students can find the missing factor.**

Student Activity: "Find the Missing Factor!"

Materials Needed:

Index cards with incomplete multiplication equations (e.g., ___ × 4 = 12)

Counters, **cubes**, **mini-erasers**, or **blocks** (for modeling equal groups)

Paper or whiteboards (for drawing circles/groups and writing equations)

Pencils or dry-erase markers



Instructions:

Prepare the Cards:

Your teacher will give you index cards with multiplication equations that have a **missing factor**.

Example: ___ **× 4 = 12**

Work in Pairs or Small Groups:

One student chooses a card and **gives a clue** to the others, like:

"One factor is 3"OR "There are 3 equal groups"

Represent the Clue:

The other students will:

Draw 3 circles and add objects inside them OR **use cups, counters, or blocks** to build the groups.

Keep adding until they find the **missing factor** (how many in each group or how many groups in total)

Write the Equation:

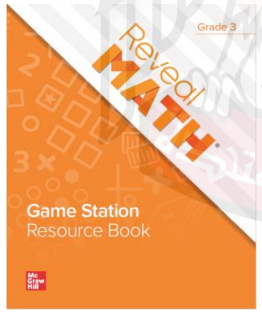
Once the unknown factor is found, write the full multiplication sentence. Example: 3 × 4 = 12

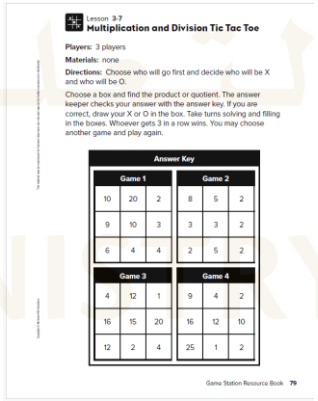
Mastery

- **Students can use representations to determine the unknown in a multiplication or division equation.**

Student Activity: Multiplication and Division Tic Tac

- Answer **Multiplication and Division Tic Tac Toe** in Game Station Resource Book Pages 79 to 81







Beyond Mastery

- **Students can use representations to determine and explain the unknown in a multiplication or division equation.**

Student Activity: "Math Investigator: The Case of the Missing Number"

Instructions : Pick a Mystery Card:

Your teacher will prepare cards with equations missing a number.

Examples:

__ × 4 = 36

56 ÷ __ = 8

Be a Math Detective:

Use **visual models** to solve the mystery:

Draw equal groups, **arrays**, or **number lines** to represent what's known

Think: "What's missing? A group size? A number of groups? A total?"

Show & Solve: Use your model to **find the unknown number**

Write the **completed equation**

Explain your strategy in a sentence or two

➤ "I knew that 4 groups of what number makes 36, so I drew 4 groups and split 36 into equal parts."

Challenge Round (Beyond Mastery Extension):

Create **your own mystery equation** with a missing number. Trade with a partner and solve each other's using models. Explain how your model proves the solution

Bonus Task: For each equation, show **two different models** (e.g., an array and a number line) that both solve the problem.

Domain

Operations and Algebraic Thinking

Standards

3.OA.A.4

Determine the unknown whole number in a multiplication or division equation relating three whole numbers.

SMPs

MPs 3

Key Vocabulary

Unknown

Identify

Determine

Basic Numeracy Skills

- ☐ Subtraction
- ☐ Multiplication
- ☐ Division

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3-7 Find the Unknown

Learning Objectives

Students should be able to: Use representations to determine the unknown in a multiplication or division equation.

Towards Mastery

Lesson 3-7 • Reinforce Understanding

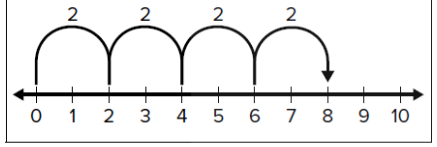
Find the Unknown

Name _____

Review

You can use a number line to model multiplication and division.

$4 \times \boxed{2} = 8$ $8 \div \boxed{4} = 2$



Draw a number line to model each of the following.

1. $? \times 3 = 15$
2. $18 \div 2 = ?$
3. $12 \div ? = 2$

Complete the multiplication and division equation for each model.

4. 

$12 \div 3 =$ ____

$3 \times$ ____ $= 12$

5. X X X X X X X X
X X X X X X X X

____ $\times 8 = 16$

$16 \div 8 =$ ____

Differentiation Resource Book
37

Mastery

Lesson 3-7

Additional Practice

Name _____

Review

You can use equal groups or arrays to find the unknown in a multiplication or division equation.

Evie has 15 toy cars in boxes. There are the same number of cars in each box.

Group Size Unknown

Evie has 15 toy cars in 5 boxes.

How many toy cars are in each box?



$15 \div 5 = \square$

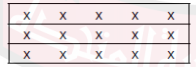
$5 \times \square = 15$

3 toy cars

Number of Groups Unknown

Evie has 15 toy cars in boxes. There are 5 toy cars in each box.

How many boxes does she use?



$\square \times 5 = 15$

$15 \div 5 = \square$

3 boxes

Draw a representation to find the unknown.

1. $7 \times$ _____ $= 42$
2. _____ $\times 3 = 24$
3. $5 \times$ _____ $= 25$

Student Practice Book
37

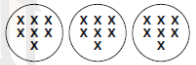
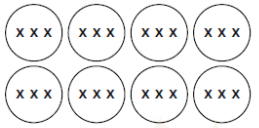
Beyond Mastery

Lesson 3-7 • Extend Thinking

Find the Unknown

Name _____

Write a word problem that may be represented by the model. Then write a multiplication and division equation to represent the unknown and solve.

1. 
2. 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
3. 

Differentiation Resource Book
38

Domain

Operations and Algebraic Thinking

Standards

3.OA.A.4

Determine the unknown whole number in a multiplication or division equation relating three whole numbers.

SMPs

MPs 3

Key Vocabulary

Unknown
Identify
Determine

Basic Numeracy Skills

- ☐ Subtraction
- ☐ Multiplication
- ☐ Division

Notes/Links

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Use Patterns to Multiply by 0, 1, 2, 5, and 10

Notes & Guidance

In this unit, students extend their knowledge of place value to 3- and 4-digit numbers and apply this to adding and subtracting 3-digit numbers. They use place value strategies, rounding, and compatible numbers to estimate sums and differences. Students deepen their understanding of addition properties by learning that the order or grouping of addends does not change the sum. They also explore even and odd addition patterns for checking accuracy. Additionally, students use their understanding of place value strategies to solve two-step word problems.

Game Station Book Is available in Reveal Platform and will be attached to the CCG File

Pedagogy

- Use of multiplication tables to highlight patterns.
- Concrete and visual models (arrays, grouping, number lines).
- Integration of skip counting and doubling strategies.
- Hands-on activities to reinforce conceptual understanding.
- Mathematical discourse and explanation of reasoning

Overall Focus

- Develop pattern recognition in multiplication to support fluency.
- Connect visual strategies to symbolic multiplication.
- Enhance strategic reasoning in solving and checking problems

Key Skills & Learning Goals

- Identify and apply patterns when multiplying by 0, 1, 2, 5, and 10.
- Use multiplication patterns to estimate and verify answers.
- Relate multiplication to repeated addition and equal groups.
- Use a multiplication fact table as a tool for identifying patterns.

International Assessment Links

IEA TIMSS

Recognizing and Using Multiplication Patterns

Aligned with the Number content domain and the Applying cognitive domain. Students identify repeated addition patterns (e.g., counting by 2s, 5s, or 10s) and use them to solve multiplication problems. The focus is on recognizing regularities and rules that make multiplication facts easier to recall.

PISA

Multiplying by 0 and 1 (Identity and Zero Property)

Links to Uncertainty and Quantity. Students reason logically about scenarios involving "none" or "one set," such as calculating total absence (0) or reproducing exact quantities (1), enhancing their problem-solving fluency in quantitative settings.

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Unit 4 – Use Patterns to Multiply by 0, 1, 2, 5, and 10
Learning Objectives & Criteria

Unit Goal:
Discover the patterns in products involving number 0,1,2,3,4,5 and 10.

Learning Objective (LO)	Common Core State Standard	Formative Assessment Criteria
• Describe and use patterns to multiply by 2.	◆ 3.OA.C.5 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.	• If you double 7, what do you get? How does that relate to multiplying by 2?
• Describe and use patterns to multiply by 5.		• Look at the list of products: 5, 10, 15, 20... What do all these numbers have in common? What comes next?
• Describe and use patterns to multiply by 10.		• What pattern do you see when multiplying numbers by 10? Can you explain it in your own words?
• Describe and use patterns to multiply with 0and1.	◆ 3.OA.C.5 ◆ 3.OA.D.9 Identify arithmetic patterns (including patterns in the addition table or multiplication table) and explain them using properties of operations.	• What happens when you multiply any number by 0? Can you give an example? • What do you notice when you multiply a number by 1? Does the number change? Why or why not?
• Use known patterns to solve unknown facts.	◆ 3.OA.C.7 Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division	• If you know that 5 × 2 = 10, how can you use that fact to find 5 × 4? • If you know 6 × 3 = 18, what do you think 6 × 6 would be? How did you figure it out?
• Represent a problem with equal groups and an equation. • Use equal groups to solve an equation.	◆ 3.OA.A.3 Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities ◆ 3.OA.A.4 Determine the unknown whole number in a multiplication or division equation relating three whole numbers.	• Can you draw a picture to show 3 equal groups of 4 objects? What equation matches your drawing? • If the equation is 5 × 2 = ___, how many equal groups will you draw? How many objects in each group?

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4-1 Use Patterns to Multiply by 2

Learning Objectives

Students should be able to: Describe and use patterns to multiply by 2.

Towards Mastery

- **Students will link between doubling through addition and multiplying by 2.**

Student Activity: "Double It!"

Materials:



Spinner labeled 0–9
(can be physical or digital)
Paper or math journals (for writing equations and reflections)

Instructions:

Work with 3–4 students.

Take Turns Spinning:

One student spins a **spinner labeled 0–9** and **calls out the number**.

Write Your Equations:

All group members write **two equations** to show **doubling** the number:

One as **repeated addition** (e.g., 5 + 5 = 10)
One as **multiplication** (e.g., 2 × 5 = 10)

Talk About It:

Discuss how both equations show the same thing.

➤ "What does doubling really mean?"
➤ "Why is multiplying by 2 the same as adding the number twice?"

Keep It Going:

Let the next student spin and repeat the activity with the new number.

Extension Challenge (Optional):

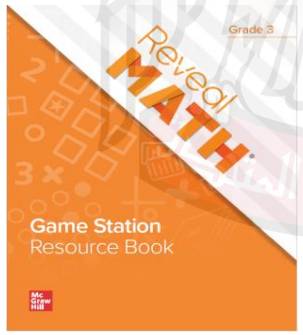
Use **larger numbers** (e.g., spin twice and add the numbers together) or explore **tripling** and compare it with doubling.

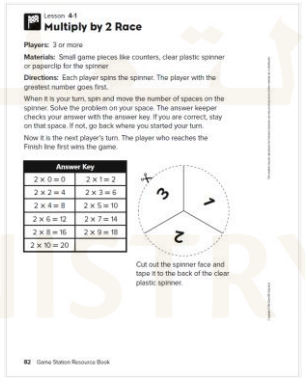
Mastery

- **Students will describe and use patterns to multiply by 2.**

Student Activity: Multiply by 2 Race

Answer **Multiply by 2 Race** in Game Station Resource Book Pages 82 to 83




Lesson 4-1
Multiply by 2 Race

Players: 3 or more

Materials: Small game pieces like counters, clear plastic spinner or paperclip for the spinner

Directions: Each player spins the spinner. The player with the greatest number goes first.

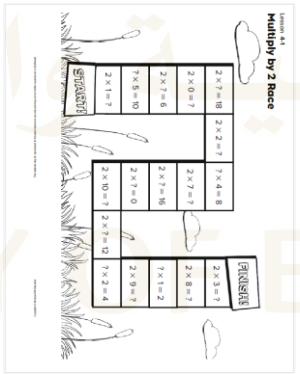
When it is your turn, spin and move the number of spaces on the spinner. Solve the problem on your space. The answer keeper checks your answer with the answer key. If you are correct, stay on that space. If not, go back where you started your turn.

Now it is the next player's turn. The player who reaches the Finish line first wins the game.

Answer Key	
2 × 0 = 0	2 × 1 = 2
2 × 2 = 4	2 × 3 = 6
2 × 4 = 8	2 × 5 = 10
2 × 6 = 12	2 × 7 = 14
2 × 8 = 16	2 × 9 = 18
2 × 10 = 20	

Cut out the spinner face and tape it to the back of the clear plastic spinner.

82 Game Station Resource Book



Beyond Mastery

- **Students will fluently describe and use patterns to multiply by 2.**

Student Activity: "Pattern Detectives: The Power of 2"

Instructions for Students:

Create the Pattern Table: In your math journal or worksheet, make a T-chart

Number	Number x 2
2	4
3	6
12	...

Complete the 2 times table up to 2 × 12.

Investigate the Pattern: What do you notice about the products? Are they even or odd? What happens to the numbers each time? Can you find a skip-counting rule?

Highlight Your Observations: Write 3–4 complete sentences describing patterns in the multiplication table of 2.

➤ "Each product increases by 2."
➤ "All products are even numbers."
➤ "The ones digits follow a 2, 4, 6, 8, 0 repeating pattern.

Apply the Pattern: Solve these higher-order tasks: What is 2 × 25? How do you know without multiplying? If the product is 62, what could the multiplication equation be?

Domain
Operations and Algebraic Thinking

Standards
3.OA.C.7
Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division

SMPs
MPs 2,6

Key Vocabulary
Multiple
Multiplication
Fact Table

Basic Numeracy Skills

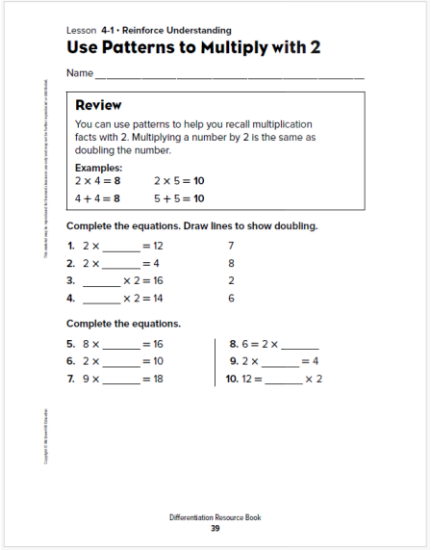
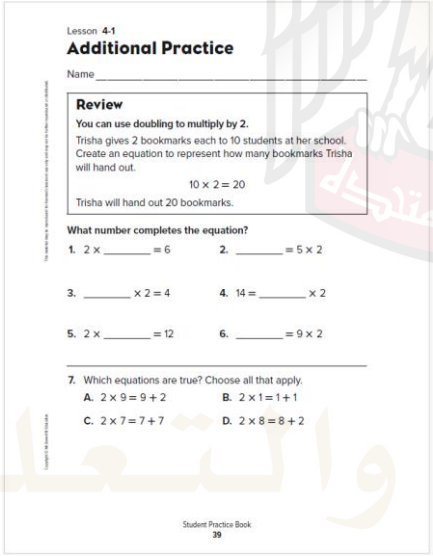
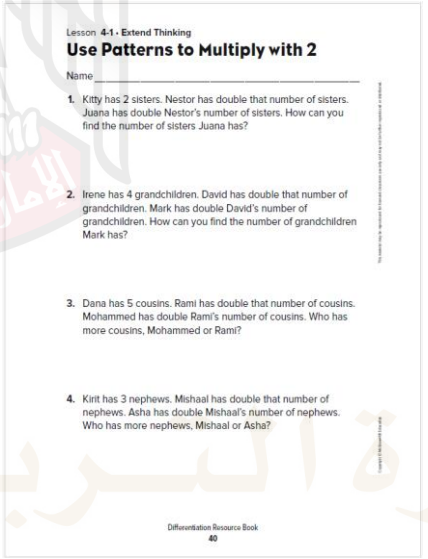
- ☐ Addition
- ☐ Subtraction
- ☐ Multiplication

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4-1 Use Patterns to Multiply by 2

Learning Objectives

Students should be able to: Describe and use patterns to multiply by 2.

Towards Mastery	Mastery	Beyond Mastery
		**Create a Pattern Puzzle (Challenge):** Design a "What's My Rule?" puzzle or riddle for a partner using the 2s pattern. Example: "I am thinking of a number. If I multiply it by 2, I get 18. What is my number?" 

Domain

Operations and Algebraic Thinking

Standards

3.OA.C.7
Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division

SMPs

MPs 2,6

Key Vocabulary

Multiple
Multiplication
Fact Table

Basic Numeracy Skills

- ☐ Addition
- ☐ Subtraction
- ☐ Multiplication

Notes/Links

White Rose Education Resources

Resources

Reveal Platform
Matific Platform

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4-2 Use Patterns to Multiply by 5

Learning Objectives

Students should be able to: Describe and use patterns to multiply by 5.

Towards Mastery

- **Students will link between skip counting by 5 and multiplying by 5.**

Student Activity: "Roll & Multiply by 5!"

Write Your Expressions:

On your paper, write all the **×5 expressions** from 1 to 10:

1x5	2x5	3x5	4x5	5x5
6x5	7x5	8x5	9x5	10x5

Take Turns Rolling:

On your turn, roll **one or two blank dice** labeled 0–5.

Use the **number rolled (or the sum)** as the factor to multiply by 5.

Solve the Expression:

Multiply the number you rolled by



If you need help, **skip count by 5s** (e.g., 5, 10, 15…).

Check and Cross It Out:

If your answer is correct, **cross out** that expression on your list.

If you already crossed it out, your turn is skipped.

Keep Playing:

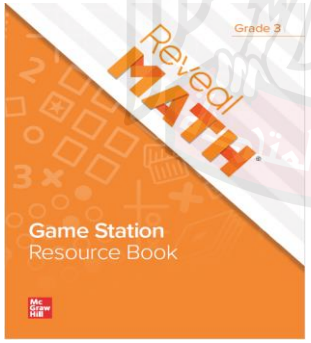
Take turns until one player **crosses out all of their expressions**.

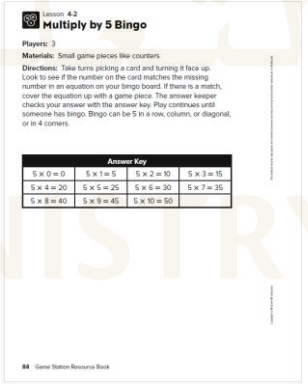
Mastery

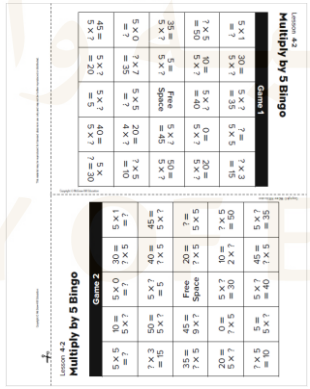
- **Students will describe and use patterns to multiply by 5.**

Student Activity: Multiply by 5 Bingo

- Answer **Multiply by 5 Bingo** in Game Station Resource Book Pages 84 to 87







Beyond Mastery

- **Students will describe and use patterns to multiply by 5 and apply it for real problems.**

Student Activity: "5 Times Detective Challenge"

Create a 5s Pattern Table:

Fill out this chart for numbers 1–20:

Factor	Factor x 5
1	5
..	..
20	?

Look for Patterns:

Use your chart to answer:

What pattern do you notice in the products?

What pattern do you see in the **ones digit**?

What do you notice about the **differences** between the products?

Are all products **even or odd**? Why?

Use the Pattern to Solve Riddles:

Try these:

"I am a product in the 5s table and end with a 0. What factor might I have?"

"Which products come right before a multiple of 10?"

Apply the Pattern to Real Problems:

Solve this:

"There are 17 shelves with 5 books each. How many books in total?"

"If there are 95 stickers and each student gets 5, how many students get stickers?"

Domain

Operations and Algebraic Thinking

Standards

3.OA.C.7

SMPs

MPs 2,4

Key Vocabulary

Skip Count
Pattern
Multiplication

Basic Numeracy Skills

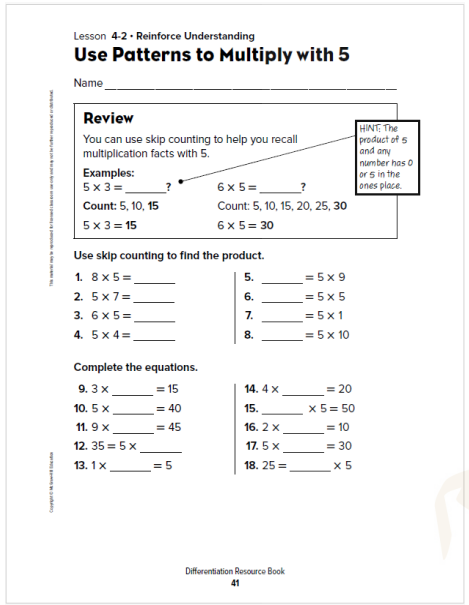
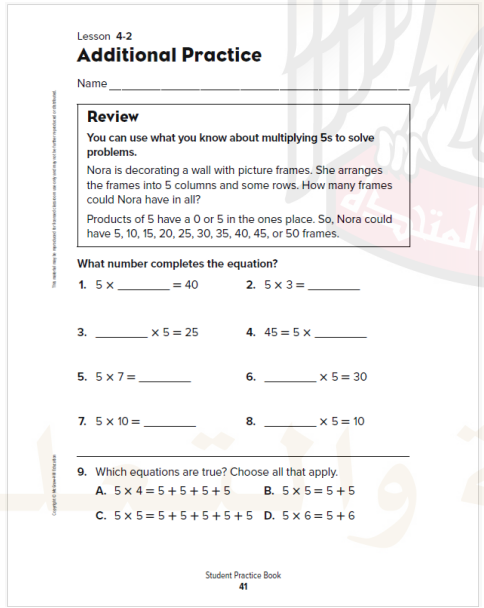
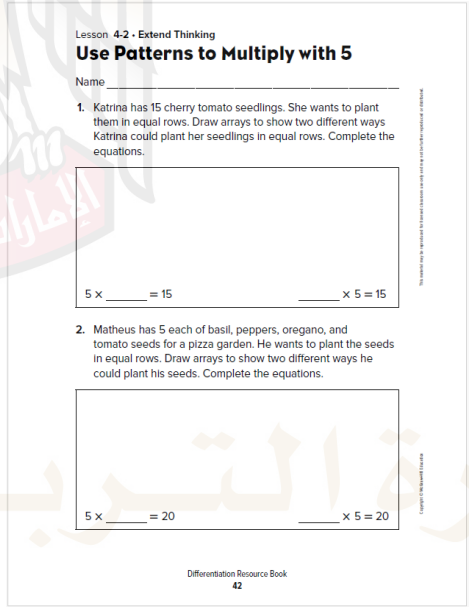
- ☐ Addition
- ☐ Subtraction
- ☐ Multiplication

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4-2 Use Patterns to Multiply by 5

Learning Objectives

Students should be able to: Describe and use patterns to multiply by 5.

Towards Mastery	Mastery	Beyond Mastery
		**Create a Pattern Puzzle (Beyond Mastery Challenge):** Design your own **pattern-based math riddle or code** using the 5s multiplication table. Example: "My product is more than 50, less than 80, and ends with a 5. What could it be?" 

Lesson 4-2 · Reinforce Understanding

Use Patterns to Multiply with 5

Name _____

Review

You can use skip counting to help you recall multiplication facts with 5.

HINT: The product of 5 and any number has 0 or 5 in the ones place.

Examples:

5 × 3 = _____? 6 × 5 = _____?

Count: 5, 10, **15** Count: 5, 10, 15, 20, 25, **30**

5 × 3 = **15** 6 × 5 = **30**

Use skip counting to find the product.

1. 8 × 5 = _____
2. 5 × 7 = _____
3. 6 × 5 = _____
4. 5 × 4 = _____
5. _____ = 5 × 9
6. _____ = 5 × 5
7. _____ = 5 × 1
8. _____ = 5 × 10

Complete the equations.

9. 3 × _____ = 15
10. 5 × _____ = 40
11. 9 × _____ = 45
12. 35 = 5 × _____
13. 1 × _____ = 5
14. 4 × _____ = 20
15. _____ × 5 = 50
16. 2 × _____ = 10
17. 5 × _____ = 30
18. 25 = _____ × 5

Differentiation Resource Book 41

Lesson 4-2

Additional Practice

Name _____

Review

You can use what you know about multiplying 5s to solve problems.

Nora is decorating a wall with picture frames. She arranges the frames into 5 columns and some rows. How many frames could Nora have in all?

Products of 5 have a 0 or 5 in the ones place. So, Nora could have 5, 10, 15, 20, 25, 30, 35, 40, 45, or 50 frames.

What number completes the equation?

1. 5 × _____ = 40
2. 5 × 3 = _____
3. _____ × 5 = 25
4. 45 = 5 × _____
5. 5 × 7 = _____
6. _____ × 5 = 30
7. 5 × 10 = _____
8. _____ × 5 = 10

9. Which equations are true? Choose all that apply.

A. 5 × 4 = 5 + 5 + 5 + 5

B. 5 × 5 = 5 + 5

C. 5 × 5 = 5 + 5 + 5 + 5 + 5

D. 5 × 6 = 5 + 6

Student Practice Book 41

Lesson 4-2 · Extend Thinking

Use Patterns to Multiply with 5

Name _____

1. Katrina has 15 cherry tomato seedlings. She wants to plant them in equal rows. Draw arrays to show two different ways Katrina could plant her seedlings in equal rows. Complete the equations.

5 × _____ = 15 _____ × 5 = 15

2. Matheus has 5 each of basil, peppers, oregano, and tomato seeds for a pizza garden. He wants to plant the seeds in equal rows. Draw arrays to show two different ways he could plant his seeds. Complete the equations.

5 × _____ = 20 _____ × 5 = 20

Differentiation Resource Book 42

Domain
Operations and Algebraic Thinking

Standards
3.OA.C.7

SMPs
MPs 2,4

Key Vocabulary
Skip Count
Pattern
Multiplication

Basic Numeracy Skills

- ☐ Addition
- ☐ Subtraction
- ☐ Multiplication

Notes/Links

White Rose Education Resources

Resources

Reveal Platform
Reveal Teacher Guide
Reveal Differentiation Resource Book

matific

Mc Graw Hill

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4-3 Use Patterns to Multiply by 10

Learning Objectives

Students should be able to: Describe and use patterns to multiply by 10.

Towards Mastery

- **Students will explore the pattern of multiplying by 10 through skip counting and pattern spotting.**

🔢 **Student Activity : "**Skip and Stick!**"**

🧱 **Materials:**

Sticky notes or number cards (with numbers: 10, 20, 30, ... up to 100)
A large number line (tape on the floor or on the board)
Markers
Multiplication chart (optional)

📝 **Instructions:**

Visual Steps:**
🟨 1. Place number cards (10, 20, ..., 100) along the floor or board.
👟 2. Walk and count by 10s as a class: "10, 20, 30..."
📝 3. Each student gets a multiplication fact (e.g., 5 × 10 = 50).
📌 4. Match your fact to the correct number on the line.
🔍 5. Say the pattern: Every answer ends in ZERO!

Spot the Pattern:

Ask:

"What do you notice about the answers?"
"What happens when we multiply a number by 10?"

📍 *Guide them to discover:*

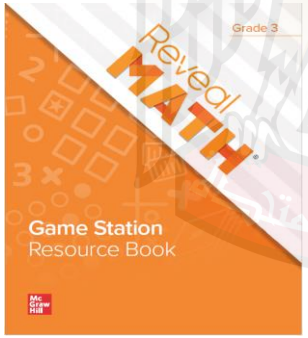
"Every answer ends in zero!" or "The digit moves one place to the left and we add a zero!"

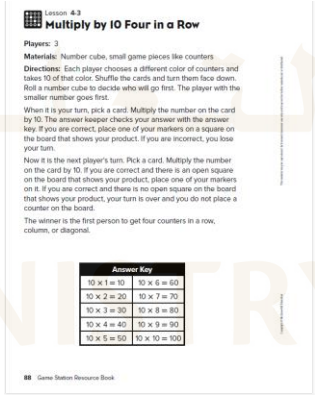
Mastery

- **Students will describe and use patterns to multiply by 10.**

🔢 **Student Activity :** Multiply by 10 in a Row

- Answer **Multiply by 10 in a Row** in Game Station Resource Book Pages 88 to 90




Lesson 4-3
Multiply by 10 Four in a Row

Players: 3

Materials: Number cube, small game pieces like counters

Directions: Each player chooses a different color of counters and takes 10 of that color. Shuffle the cards and turn them face down. Roll a number cube to decide who will go first. The player with the smaller number goes first.

When it is your turn, pick a card. Multiply the number on the card by 10. The answer keeper checks your answer with the answer key. If you are correct, place one of your markers on a square on the board that shows your product. If you are incorrect, you lose your turn.

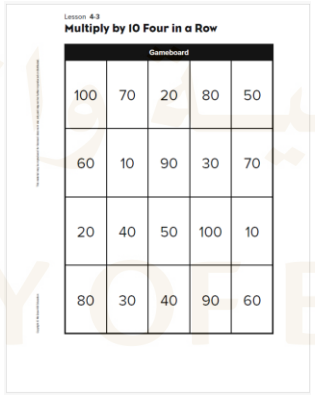
Now it is the next player's turn. Pick a card. Multiply the number on the card by 10. If you are correct and there is an open square on the board that shows your product, place one of your markers on it. If you are correct and there is no open square on the board that shows your product, your turn is over and you do not place a counter on the board.

The winner is the first person to get four counters in a row, column, or diagonal.

Answer Key

10 × 1 = 10	10 × 6 = 60
10 × 2 = 20	10 × 7 = 70
10 × 3 = 30	10 × 8 = 80
10 × 4 = 40	10 × 9 = 90
10 × 5 = 50	10 × 10 = 100

88 Game Station Resource Book


Lesson 4-3
Multiply by 10 Four in a Row

Gameboard

100	70	20	80	50
60	10	90	30	70
20	40	50	100	10
80	30	40	90	60

Beyond Mastery

- **Students will apply and explain patterns in multiplying by 10 through a self-created math maze and peer challenge.**

🔢 **Student Activity: "**Pattern Detectives: Multiply by 10 Maze"

📝 **Instructions:**

Create a Number Maze Board

Each student or pair creates a **5×5 grid** filled with numbers.
Some numbers must be **products of multiplying by 10** (e.g., 40, 90, 120).
Others are **decoys** (not multiples of 10).

Design the Maze Path

Students secretly choose a correct path from start to finish that follows the "×10 rule" (every number on the path must be a correct product of multiplying by 10).

Write Clue Cards

They write **clue cards** that describe patterns in the path:

📍 *Example clues:*

"Each number increases by 10"
"Skip one multiple of 10 each step"
The path ends at a 3-digit number that ends in 0"

Challenge a Classmate

Students trade mazes and clue cards.
Their partner must:
Identify the correct path using the multiplication pattern
Justify why each number fits the rule
Write their own "×10" equation for each step

Domain

Operations and Algebraic Thinking

Standards

3.OA.C.7
Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division

SMPs

MPs 2,7

Key Vocabulary

Skip Count
Pattern
Multiplication
Fact Table

Basic Numeracy Skills

- ☐ Addition
- ☐ Subtraction
- ☐ Multiplication

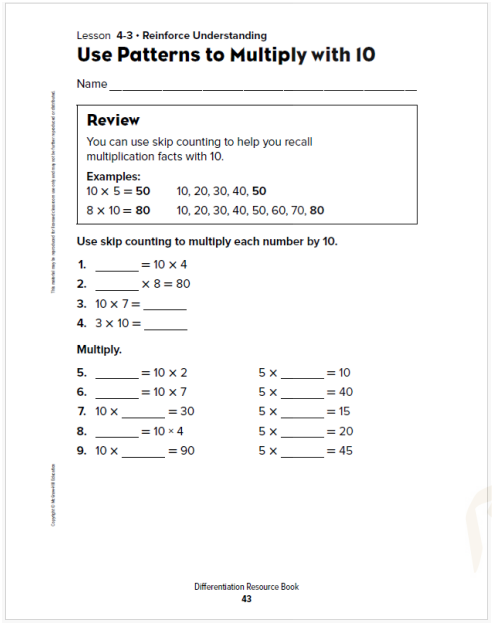
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4-3 Use Patterns to Multiply by 10

Learning Objectives

Students should be able to: Describe and use patterns to multiply by 10.

Towards Mastery	Mastery	Beyond Mastery
Wrap-Up Discussion: Highlight the idea that **multiplying by 10 means making a number 10 times bigger** and **always ends in a 0**.		



Lesson 4-3 • Reinforce Understanding

Use Patterns to Multiply with 10

Name _____

Review

You can use skip counting to help you recall multiplication facts with 10.

Examples:

10 × 5 = **50** 10, 20, 30, 40, **50**

8 × 10 = **80** 10, 20, 30, 40, 50, 60, 70, **80**

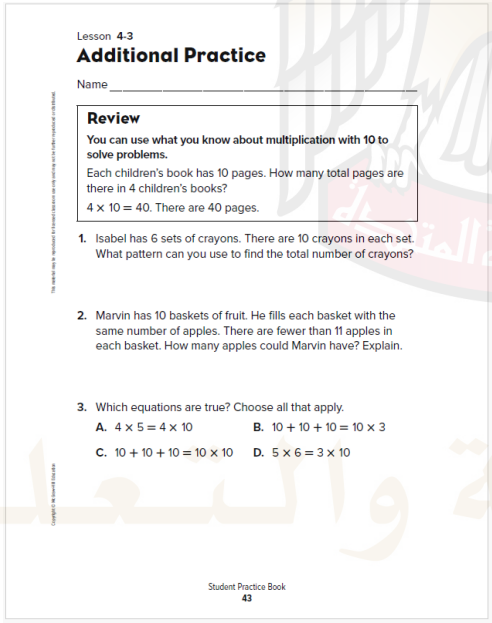
Use skip counting to multiply each number by 10.

1. _____ = 10 × 4
2. _____ × 8 = 80
3. 10 × 7 = _____
4. 3 × 10 = _____

Multiply.

5. _____ = 10 × 2 5 × _____ = 10
6. _____ = 10 × 7 5 × _____ = 40
7. 10 × _____ = 30 5 × _____ = 15
8. _____ = 10 × 4 5 × _____ = 20
9. 10 × _____ = 90 5 × _____ = 45

Differentiation Resource Book 43



Lesson 4-3

Additional Practice

Name _____

Review

You can use what you know about multiplication with 10 to solve problems.

Each children's book has 10 pages. How many total pages are there in 4 children's books?

4 × 10 = 40. There are 40 pages.

1. Isabel has 6 sets of crayons. There are 10 crayons in each set. What pattern can you use to find the total number of crayons?

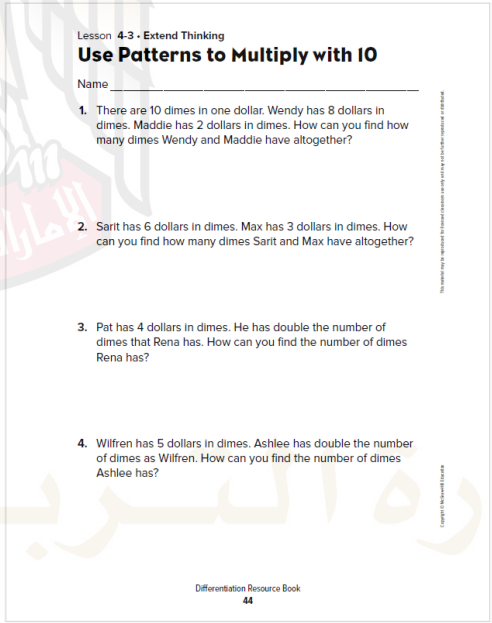
2. Marvin has 10 baskets of fruit. He fills each basket with the same number of apples. There are fewer than 11 apples in each basket. How many apples could Marvin have? Explain.

3. Which equations are true? Choose all that apply.

   A. 4 × 5 = 4 × 10 **B.** 10 + 10 + 10 = 10 × 3

   C. 10 + 10 + 10 = 10 × 10 **D.** 5 × 6 = 3 × 10

Student Practice Book 43



Lesson 4-3 • Extend Thinking

Use Patterns to Multiply with 10

Name _____

1. There are 10 dimes in one dollar. Wendy has 8 dollars in dimes. Maddie has 2 dollars in dimes. How can you find how many dimes Wendy and Maddie have altogether?

2. Sarit has 6 dollars in dimes. Max has 3 dollars in dimes. How can you find how many dimes Sarit and Max have altogether?

3. Pat has 4 dollars in dimes. He has double the number of dimes that Rena has. How can you find the number of dimes Rena has?

4. Wilfren has 5 dollars in dimes. Ashlee has double the number of dimes as Wilfren. How can you find the number of dimes Ashlee has?

Differentiation Resource Book 44

Domain

Operations and Algebraic Thinking

Standards

3.OA.C.7

Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division

SMPs

MPs 2,7

Key Vocabulary

Skip Count
Pattern
Multiplication
Fact Table

Basic Numeracy Skills

- ☐ Addition
- ☐ Subtraction
- ☐ Multiplication

Notes/Links

White Rose Education Resources

Resources

Reveal Platform

Matific Platform

matific

Mc Graw Hill

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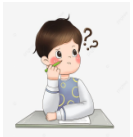
4-4 Use Patterns to Multiply by 1 and 0

Learning Objectives

Students should be able to: Describe and use patterns to multiply with 0and1.

Towards Mastery	Mastery	Beyond Mastery
• **Students will explore the special rules of multiplying by 0 and 1 by writing and solving mystery word problems.**	• **Students will describe and use patterns to multiply with 0and1.**	• **Students will fluently and accurately describe and use patterns to multiply with 0and1.**

Student Activity: "Guess the Mystery Number!"



Instructions:

Work in Pairs

Partner up with a classmate. One of you will be the **Writer**, and the other will be the **Guesser**.

Write a Word Problem

Think of a **real-life example** involving multiplication by **0 or 1**, but don't say which number it is!

Use a **question mark (?)** to hide the missing number.

Example:

"A box has 0 rows of books. There are ? books in each row. How many books in total?"

Make the Equation

Write a matching multiplication sentence with a missing number:

Equation: 0 × ? = ?

Share and Solve

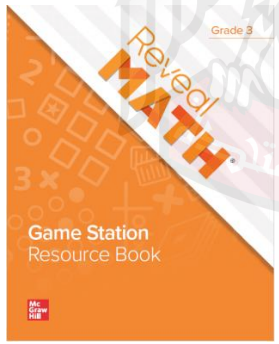
Read your word problem out loud.

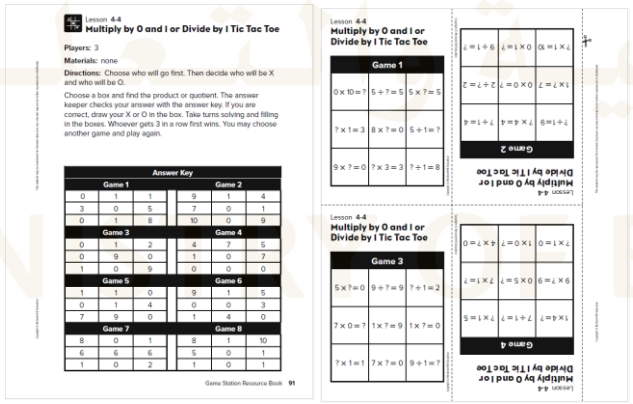
Let your partner **guess the missing number** and decide if it's multiplying by 0 or 1.

Then check by showing the full equation.

Student Activity: Multiply by 0 or **1**

- Answer **Multiply by 0 or 1** in Game Station Resource Book Pages 91to 93





Student Activity: The Factor Detective Challenge

1. Team Up

Form teams of 2–3 students.

2. Create a Two-Part Word Problem

Your team will:

Write a **two-step word problem** where:

One step includes multiplying with **0 or 1 as a factor**.

The second step uses the result to solve another multiplication or division problem.

Use a **question mark (?)** to show the unknown in **one of the steps**.

Example Prompt:

A box has 0 rows of pencils. Each row would have had 4 pencils. After that, the student adds 10 more pencils to the box. How many pencils are in the box now?

3. Write the Equations

Write two connected equations that match your story. One of them should include a missing number. Use:

(? × 1 = ___) or

(___ × 0 = ?) etc.

4. Swap and Solve

Swap problems with another team.

Read their word problem and:

Identify which step uses 0 or 1.Solve the unknown.

Explain your reasoning clearly.

Domain

Operations and Algebraic Thinking

Standards

3.OA.C.7

3.OA.D.9

Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations.

SMPs

MPs 3,7

Key Vocabulary

Pattern

Multiplication

Product

Reasoning

Basic Numeracy Skills

- ☐ Addition
- ☐ Subtraction
- ☐ Multiplication

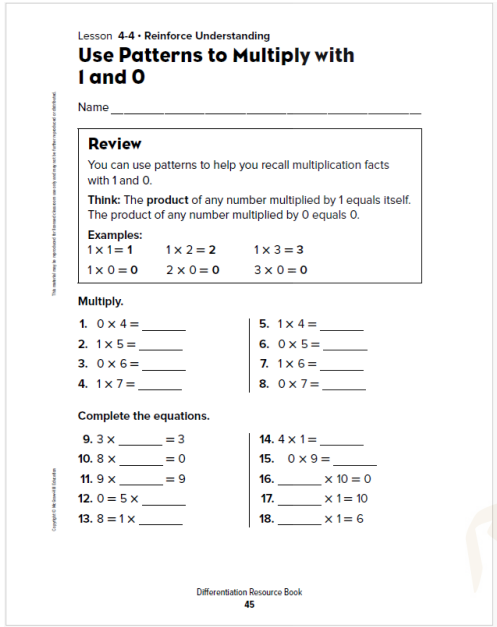
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4-4 Use Patterns to Multiply by 1 and 0

Learning Objectives

Students should be able to: Describe and use patterns to multiply with 0and1.

Towards Mastery	Mastery	Beyond Mastery
✅ **Quick Wrap-Up** Ask students: What happens when we multiply by 0? What happens when we multiply by 1? Can you solve a problem just by listening carefully?		💡 **Bonus Challenge:** Change your problem slightly so that **0 or 1 is the result**, not just a factor. Can your classmates still figure out the unknown?



Lesson 4-4 • Reinforce Understanding

Use Patterns to Multiply with 1 and 0

Name _____

Review

You can use patterns to help you recall multiplication facts with 1 and 0.

Think: The **product** of any number multiplied by 1 equals itself. The product of any number multiplied by 0 equals 0.

Examples:

1 × 1 = **1** 1 × 2 = **2** 1 × 3 = **3**

1 × 0 = **0** 2 × 0 = **0** 3 × 0 = **0**

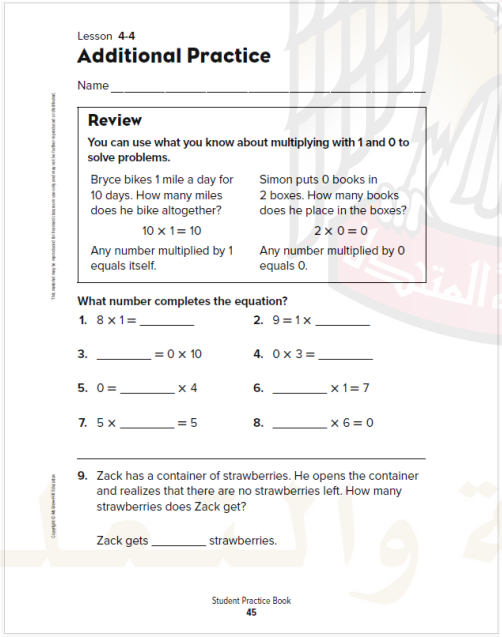
Multiply.

1. 0 × 4 = _____
2. 1 × 5 = _____
3. 0 × 6 = _____
4. 1 × 7 = _____
5. 1 × 4 = _____
6. 0 × 5 = _____
7. 1 × 6 = _____
8. 0 × 7 = _____

Complete the equations.

9. 3 × _____ = 3
10. 8 × _____ = 0
11. 9 × _____ = 9
12. 0 = 5 × _____
13. 8 = 1 × _____
14. 4 × 1 = _____
15. 0 × 9 = _____
16. _____ × 10 = 0
17. _____ × 1 = 10
18. _____ × 1 = 6

Differentiation Resource Book 45



Lesson 4-4

Additional Practice

Name _____

Review

You can use what you know about multiplying with 1 and 0 to solve problems.

Bryce bikes 1 mile a day for 10 days. How many miles does he bike altogether?

10 × 1 = 10

Any number multiplied by 1 equals itself.

Simon puts 0 books in 2 boxes. How many books does he place in the boxes?

2 × 0 = 0

Any number multiplied by 0 equals 0.

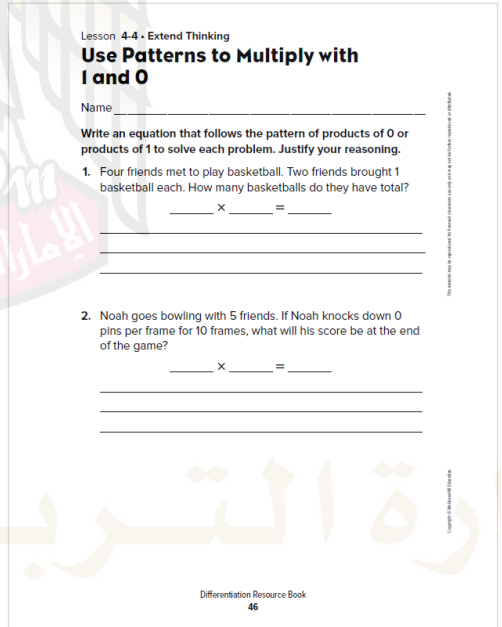
What number completes the equation?

1. 8 × 1 = _____
2. 9 = 1 × _____
3. _____ = 0 × 10
4. 0 × 3 = _____
5. 0 = _____ × 4
6. _____ × 1 = 7
7. 5 × _____ = 5
8. _____ × 6 = 0

9. Zack has a container of strawberries. He opens the container and realizes that there are no strawberries left. How many strawberries does Zack get?

Zack gets _____ strawberries.

Student Practice Book 45



Lesson 4-4 • Extend Thinking

Use Patterns to Multiply with 1 and 0

Name _____

Write an equation that follows the pattern of products of 0 or products of 1 to solve each problem. Justify your reasoning.

1. Four friends met to play basketball. Two friends brought 1 basketball each. How many basketballs do they have total?

_____ × _____ = _____

2. Noah goes bowling with 5 friends. If Noah knocks down 0 pins per frame for 10 frames, what will his score be at the end of the game?

_____ × _____ = _____

Differentiation Resource Book 46

Domain

Operations and Algebraic Thinking

Standards

3.OA.C.7

3.OA.D.9

Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations.

SMPs

MPs 3,7

Key Vocabulary

Pattern

Multiplication

Product

Reasoning

Basic Numeracy Skills

- ☐ Addition
- ☐ Subtraction
- ☐ Multiplication

Notes/Links

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4-5 Multiply Fluently by 0, 1, 2, 5, and 10

Learning Objectives

- Students should be able to: Use known patterns to solve unknown facts.

Towards Mastery

- **Students will recognize and describe patterns when multiplying by 2, 5, and 10 through a fun bingo game.**

Student Activity: "Multiply by 2, 5, or 10 – Bingo!"

Instructions:

Get Your Bingo Card
Each student receives a Bingo card filled with numbers that are **products of 2, 5, or 10**. The middle space (0) is a free space!

Listen for the Number
One student will be the **caller** and will draw a number card from the pile. If the number is on your card, cover it!

Bingo Time!
When you cover **8 numbers**, shout "BINGO!"

Explain Your Thinking
For each covered number, say:
"___ is a product of ___ because ___."
Example: *"20 is a product of 5 because 5 × 4 = 20."*

Keep Playing!
Try the same game later with **0, 5, and 10** to spot more patterns

Here is an example of Multiples of 5 5x5 Bingo table

20	10	60	2	50
12	5	80	10 0	30
4	14	0	10	40
6	70	24	8	25
16	90	18	3	15

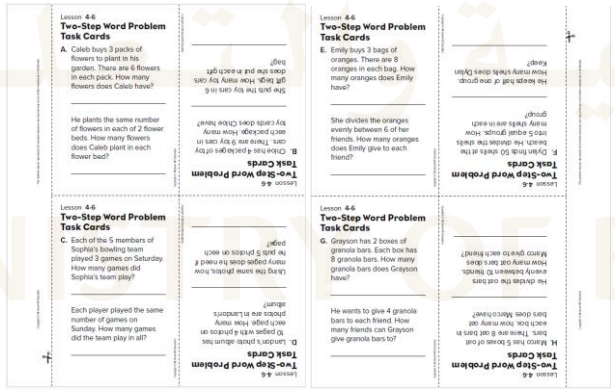
Mastery

- **Students will use known patterns to solve unknown facts .**

Student Activity: multiplication pattern Bump with 2, 5 , 10

- Answer **multiplication pattern Bump with 2, 5 , 10** in Game Station Resource Book Pages 94 to 97





Beyond Mastery

- **Students will apply multiplication patterns they already know (e.g., ×2, ×5, ×10, ×0, ×1) to deduce and justify unknown multiplication facts.**

Student Activity: Pattern Chain Puzzle

Instructions:

Build the Chain
Each group is given a **set of multiplication "clue cards."** Each card shows a multiplication fact and a clue to help solve the next.
Example Card:
**"If you know 6 × 10 = 60, what is 6 × 9? Think: 1 group less than 10."*

Link the Patterns
Students must:
Use the known fact.
Apply a pattern (e.g., subtract a group, double, halve, etc.).
Write the new fact with an explanation.
Example Response:
"6 × 9 = 54 because I subtracted one 6 from 60."

Justify Thinking
For every new fact solved, students complete this sentence frame:
"I knew ___, so I used the pattern ___ to find ___."

Extend the Puzzle
Students create their own chain of 3 or more linked facts and challenge a partner to solve it using patterns only — **no memorization!**

Domain
Operations and Algebraic Thinking

Standards
3.OA.C.7
Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division

SMPs
MPs 4,7

Key Vocabulary
Pattern
Product
Apply
Explain

Basic Numeracy Skills

- ☐ Addition
- ☐ Subtraction
- ☐ Multiplication

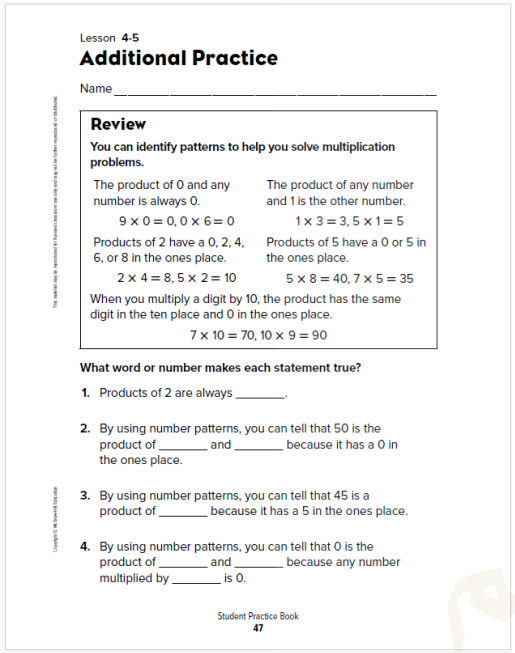
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4-5 Multiply Fluently by 0, 1, 2, 5, and 10

Learning Objectives

- Students should be able to: Use known patterns to solve unknown facts.

Towards Mastery



Lesson 4-5

Additional Practice

Name _____

Review

You can identify patterns to help you solve multiplication problems.

The product of 0 and any number is always 0.
$9 \times 0 = 0, 0 \times 6 = 0$

The product of any number and 1 is the other number.
$1 \times 3 = 3, 5 \times 1 = 5$

Products of 2 have a 0, 2, 4, 6, or 8 in the ones place.
$2 \times 4 = 8, 5 \times 2 = 10$

Products of 5 have a 0 or 5 in the ones place.
$5 \times 8 = 40, 7 \times 5 = 35$

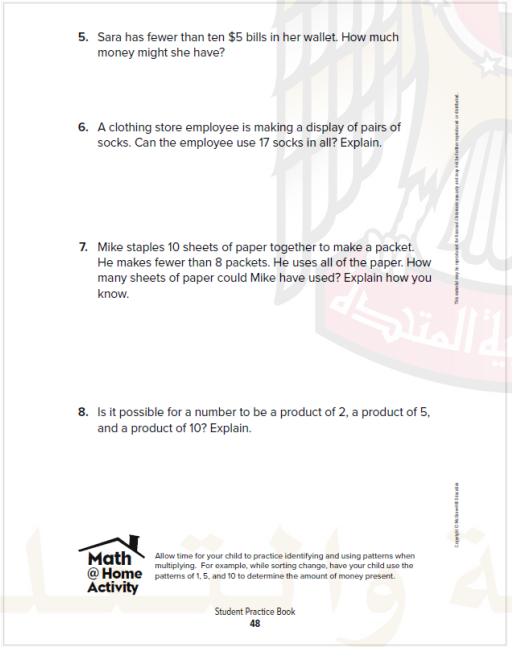
When you multiply a digit by 10, the product has the same digit in the ten place and 0 in the ones place.
$7 \times 10 = 70, 10 \times 9 = 90$

What word or number makes each statement true?

1. Products of 2 are always _____.
2. By using number patterns, you can tell that 50 is the product of _____ and _____ because it has a 0 in the ones place.
3. By using number patterns, you can tell that 45 is a product of _____ because it has a 5 in the ones place.
4. By using number patterns, you can tell that 0 is the product of _____ and _____ because any number multiplied by _____ is 0.

Student Practice Book
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Mastery



5. Sara has fewer than ten $5 bills in her wallet. How much money might she have?
6. A clothing store employee is making a display of pairs of socks. Can the employee use 17 socks in all? Explain.
7. Mike staples 10 sheets of paper together to make a packet. He makes fewer than 8 packets. He uses all of the paper. How many sheets of paper could Mike have used? Explain how you know.
8. Is it possible for a number to be a product of 2, a product of 5, and a product of 10? Explain.

Math @ Home Activity

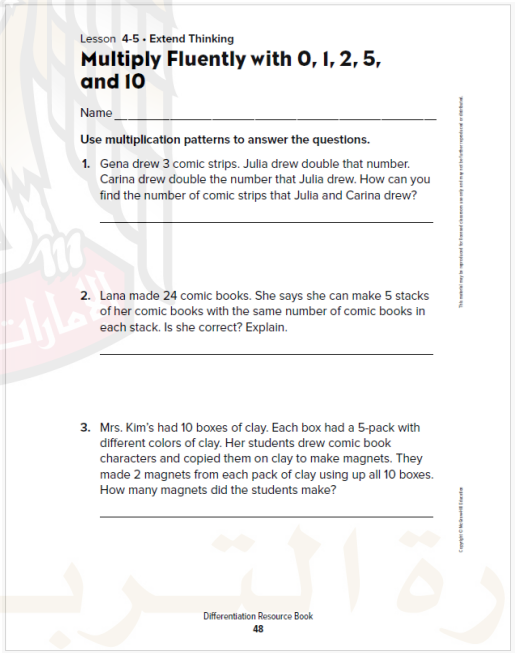
Allow time for your child to practice identifying and using patterns when multiplying. For example, while sorting change, have your child use the patterns of 1, 5, and 10 to determine the amount of money present.

Student Practice Book
48

Beyond Mastery

Challenge Example:

2 × 6 = 12
4 × 6 = ? (double 2 × 6)
8 × 6 = ? (double again!)
7 × 6 = ? (subtract 1 group from 8 × 6)



Lesson 4-5 • Extend Thinking

Multiply Fluently with 0, 1, 2, 5, and 10

Name _____

Use multiplication patterns to answer the questions.

1. Gena drew 3 comic strips. Julia drew double that number. Carina drew double the number that Julia drew. How can you find the number of comic strips that Julia and Carina drew?
2. Lana made 24 comic books. She says she can make 5 stacks of her comic books with the same number of comic books in each stack. Is she correct? Explain.
3. Mrs. Kim's had 10 boxes of clay. Each box had a 5-pack with different colors of clay. Her students drew comic book characters and copied them on clay to make magnets. They made 2 magnets from each pack of clay using up all 10 boxes. How many magnets did the students make?

Differentiation Resource Book
48

Domain
Operations and Algebraic Thinking

Standards
3.OA.C.7
Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division

SMPs
MPs 4,7

Key Vocabulary
Pattern
Product
Apply
Explain

Basic Numeracy Skills

- ☐ Addition
- ☐ Subtraction
- ☐ Multiplication

Notes/Links

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4-6 Solve Problems Involving Equal Groups

Learning Objectives
Students should be able to:

- Represent a problem with equal groups and an equation.
- Use equal groups to solve an equation.

Towards Mastery

- **Students will explore how multiplication and division facts are related by building and solving equations with missing values.**

Student Activity: "Build the Mystery Equation!"

Instructions:
Make Your Equation Cards



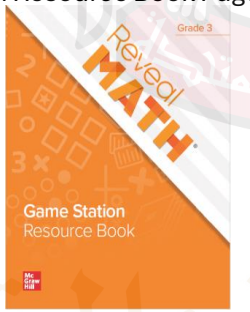
Each student gets three cards:
A number card (e.g., 64)
An operation card (÷ or ×)
A blank card (?) for the missing number
Example:
Your cards might read: 64 ÷ ? = 8
Take Turns
Take turns showing your equation to the group.
Ask your classmates:
"Can you find the missing number?"
Rebuild It!
Now switch the order and try writing a **new equation** using the same numbers:
Example:
If you had 64 ÷ ? = 8, you could also write:
8 × ? = 64
What Did You Notice?
Discuss as a class:
How are multiplication and division connected?
Can one multiplication fact give us **two division facts**?

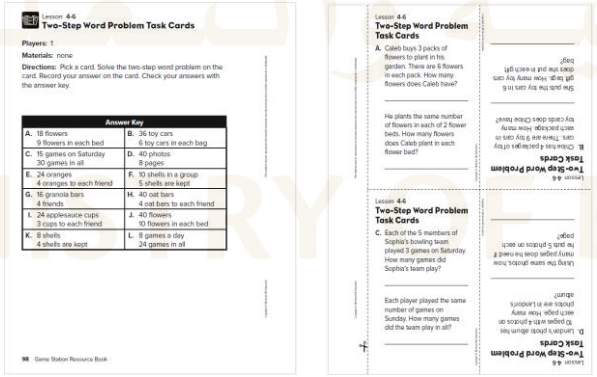
Mastery

- **Students should Represent a problem with equal groups and an equation.**
- **Use equal groups to solve an equation.**

Student Activity: Two step word problem task cards

- Answer **Two step word problem task cards** in Game Station Resource Book Pages 99 to 101





Beyond Mastery

- **Students will create real-world problems involving equal groups, represent them using equations, and solve them in multiple ways to show flexibility and deep understanding.**

Student Activity: Equation Architect – Build the Group Plan.

Instructions:
Design a Real-Life Scenario
Students choose a real-life setting (e.g., **a bakery, school supply store, or theme park**) and create a problem using **equal groups**.
Example:
"There are 6 trays of cupcakes. Each tray has 8 cupcakes. How many cupcakes in total?"
Draw and Represent the Groups
Students must:
Draw the equal groups (arrays, pictures, or repeated addition)
Write the matching multiplication equation:
6 × 8 = ?
Reverse the Problem
Next, challenge students to **write a related division problem**:
If there are 48 cupcakes and 6 trays, how many are on each tray?
48 ÷ 6 = ?

Domain
Operations and Algebraic Thinking

Standards
3.OA.A.3
3.OA.A.4
Determine the unknown whole number in a multiplication or division equation relating three whole numbers.

SMPs
MPs 4,7

Key Vocabulary
Equal Groups, Unknown, Explain , Strategy

Basic Numeracy Skills

- ☐ Addition
- ☐ Subtraction
- ☐ Division

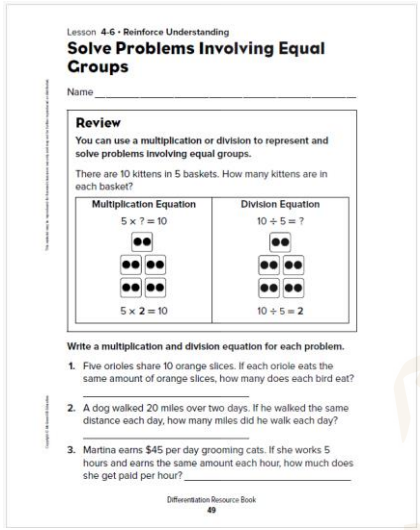
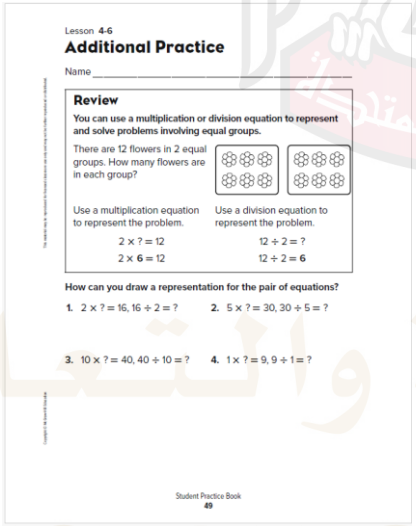
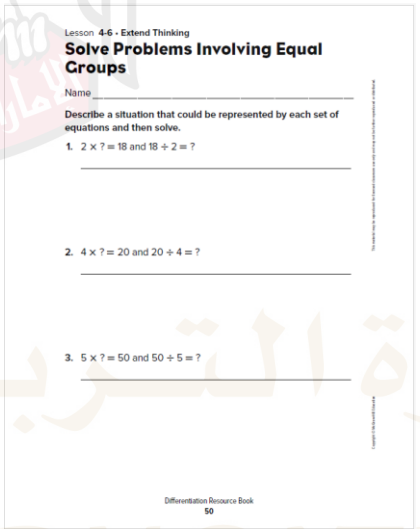
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4-6 Solve Problems Involving Equal Groups

Learning Objectives

Students should be able to:

- Represent a problem with equal groups and an equation.
- Use equal groups to solve an equation.

Towards Mastery	Mastery	Beyond Mastery
		**Build a Peer Challenge** Each group creates a **"Group Plan Challenge"** card for classmates with: A real-world context A diagram or equal-group model An equation with a **missing number** Example: *There are ? trays. Each has 5 donuts. Altogether there are 30 donuts.* *? × 5 = 30* 

Notes/Links

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Resources

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Matific Platform

Domain

Operations and Algebraic Thinking

Standards

3.OA.A.3

3.OA.A.4

Determine the unknown whole number in a multiplication or division equation relating three whole numbers.

SMPs

MPs 4,7

Key Vocabulary

Equal Groups
Unknown
Explain
Strategy

Basic Numeracy Skills

- ☐ Addition
- ☐ Subtraction
- ☐ Division

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Use Properties to Multiply by 3, 4, 6, 7, 8, and 9

Notes & Guidance

As students advance in Grade 3, they explore more strategies to solve multiplication problems. This unit emphasizes doubling as a method: when a factor doubles, the product also doubles. Students begin by relating products of 2 to products of 4 using the multiplication fact table and visual patterns. For example:

- They observe that 2 is half of 4, so they can double the 2s products to find the 4s products.
- They apply this same strategy to 3s and 6s, understanding that doubling a 3-product yields a 6-product.

Arrays and grouping strategies help students visualize and prove these relationships. Students also use known facts and combine them to find unknown ones, reinforcing the distributive property (e.g., $6 \times 7 = (5 \times 7) + (1 \times 7)$).

Game Station Book Is available in Reveal Platform and will be attached to the CCG File

Pedagogy

- Use multiplication fact tables and doubling charts.
- Visual models (arrays, area models) to show factor relationships.
- Math talk and justification of reasoning.
- Step-by-step deconstruction of multiplication facts.
- Problem-solving with multiple strategies

Overall Focus

- Strengthen fact fluency through pattern recognition and reasoning.
- Promote strategic flexibility using distributive property and visual tools.
- Foster conceptual understanding of multiplication operations

Key Skills & Learning Goals

- Apply doubling to relate known facts (e.g., 2s to 4s, 3s to 6s, etc.).
- Use arrays and representations to understand factor relationships.
- Use the distributive property to decompose and compute multiplication facts.
- Build fluency by combining known facts to derive unknown products

International Assessment Links

Apply the Distributive Property to Multiply

This topic aligns with the Applying cognitive domain in TIMSS. It emphasizes students' ability to apply known multiplication facts to new situations by decomposing one of the factors and using the Distributive Property. For example, to solve 7×6, students might break it into $(5 \times 6) + (2 \times 6)$, demonstrating understanding through visual tools such as arrays or number lines.in computation, a key TIMSS indicator of applied understanding.

Use the Associative and Commutative Properties

In PISA, this topic supports the process of Recognizing mathematical structure and reasoning logically within the Quantity content area. The associative and commutative properties help students approach complex problems by reordering or regrouping factors for efficiency. This reflects PISA's emphasis on flexible, strategic thinking and algebraic reasoning, especially in multi-step, real-life problem-solving situations.

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Unit 5 – Use Properties to Multiply by 3, 4, 6, 7, 8, and 9
Learning Objectives & Criteria

Unit Goal:
Use multiplication strategies especially doubling .

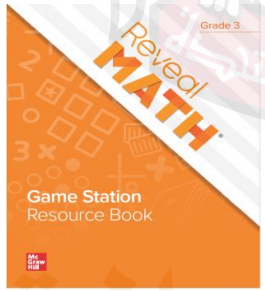
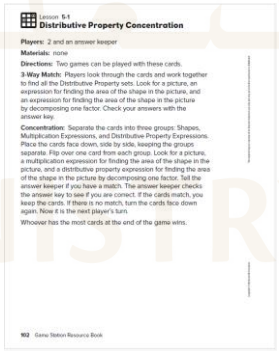
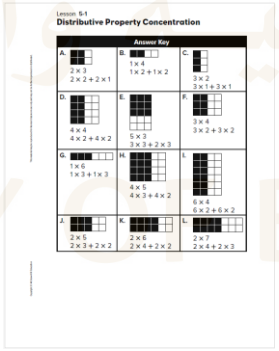
Learning Objective (LO)	Common Core State Standard	Formative Assessment Criteria
• Demonstrate an understanding of the Distributive Property.	◆ 3.OA.B.5 Apply properties of operations as strategies to multiply. (Commutative property of multiplication.) 3 × 5 × 2 can be found by 3 × 5 = 15, then 15 × 2 = 30, or by 5 × 2 = 10, then 3 × 10 = 30.	• Can you break apart the multiplication fact 6 × 7 into two smaller facts using the Distributive Property? How? • If 6 × 7 = (6 × 5) + (6 × 2), what is the total? Can you explain how this shows the Distributive Property?
• Apply the properties of multiplication to recall 3s facts.	◆ 3.OA.C.7 Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division	• What multiplication fact do you already know that could help you solve 3 × 9 quickly?
• Apply the properties of multiplication to recall 4s facts.		• How can breaking apart 4 × 6 into smaller known facts help you solve it?
• Apply the properties of multiplication to recall 6s facts.		• What known facts can you combine to help solve 6 × 8?
• Apply the properties of multiplication to recall 8s facts.		• What strategy or property helps you solve 8 × 7 quickly?
• Apply the properties of multiplication to recall 7s and 9s facts.		• Can you use a pattern to find the products in the 9s multiplication table? What do you notice?
• Represent a problem with arrays and an equation. Use arrays and properties of multiplication to solve an equation.	◆ 3.OA.A.3 Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities ◆ 3.OA.A.4 Determine the unknown whole number in a multiplication or division equation relating three whole numbers	• Can you draw an array to match this problem: "There are 4 rows of 3 apples each"? • If I give you the array 2 × 5, can you write the matching word problem?

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5-1 Understand the Distributive Property

Learning Objectives

Students should be able to: Demonstrate an understanding of the Distributive Property.

Towards Mastery	Mastery	Beyond Mastery
• **Students will break apart arrays to explore how multiplication facts can be decomposed into smaller facts.**	• **Students will demonstrate an understanding of the Distributive Property.**	• **Students will demonstrate an understanding of the Distributive Property in the real-world applications.**
Student Activity: "Array Chopped Challenge!"	**Student Activity:** Distributive Property Concentration	**Student Activity:** "Math City Builders – Distributive Design Challenge"
Instructions: **Cut Out Your Array** Each student receives an 8 × 8 array made of centimeter grid paper. Cut out the square neatly. **"Chop" the Array** When the teacher says **"Chopped!"**, cut your array into **two smaller rectangles** any way you like. (You can cut vertically or horizontally.) **Glue and Record** Glue the two parts onto a blank sheet of paper. Next to each part, write a multiplication sentence that matches its size. Example: 8 × 8 becomes **8 × 5** and **8 × 3** **Add to Check** Add your two multiplication products together to see if they equal the total area of the original array. **Wrap-Up Question:** "What happens when we break a multiplication problem into parts?" "Does the total change?"	• Answer **Distributive Property Concentration** in Game Station Resource Book Pages 102 to 107   	**Instructions:** **Welcome to Math City!** You are city planners! Your job is to design building plots using **rectangular arrays** — but you can only use **split rectangles** that model the **distributive property**. **Start with a Rectangle** Each group is assigned a large rectangle (e.g., 8 × 6) and must: **Break it into two smaller rectangles** (e.g., 8 × 4 and 8 × 2) **Write an equation** for each: *8 × 6 = (8 × 4) + (8 × 2)* **Build the Equation Trail** On grid paper or a poster, students: **Draw** the full rectangle and label the two parts **Explain** how the distributive property helps find the total area **Use color coding** to show each partial product **Create a Real-World Story** Write a short story problem using your rectangle. *Example:* *"We built a sports field that was 8 meters wide. One section is 4 meters long for soccer and the other is 2 meters long for basketball. What's the total area of the sports field?"*

Domain

Operations and Algebraic Thinking

Standards

3.OA.B.5

Apply properties of operations as strategies to multiply and divide.[2]

SMPs

MPs 7,8

Key Vocabulary

Array
Decompose
Multiplication
Product
Analyz
Strategy

Basic Numeracy Skills

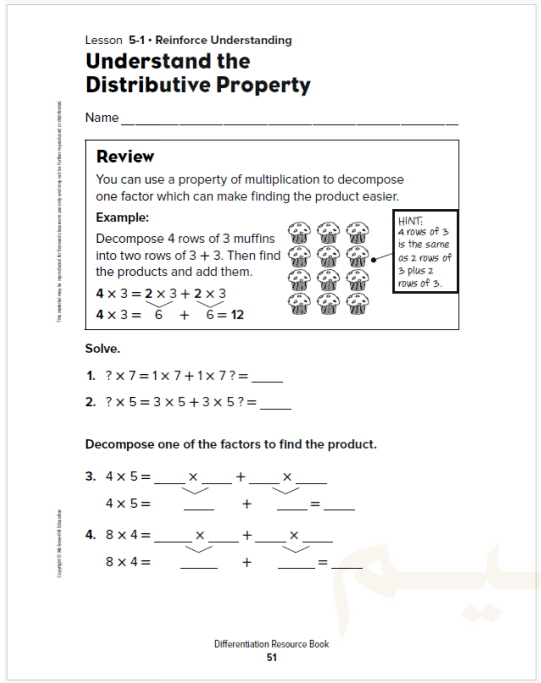
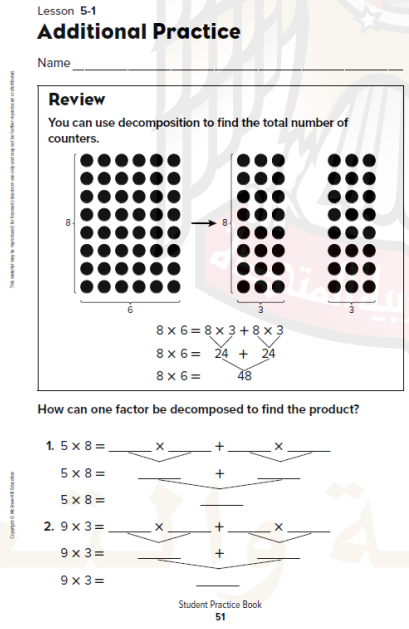
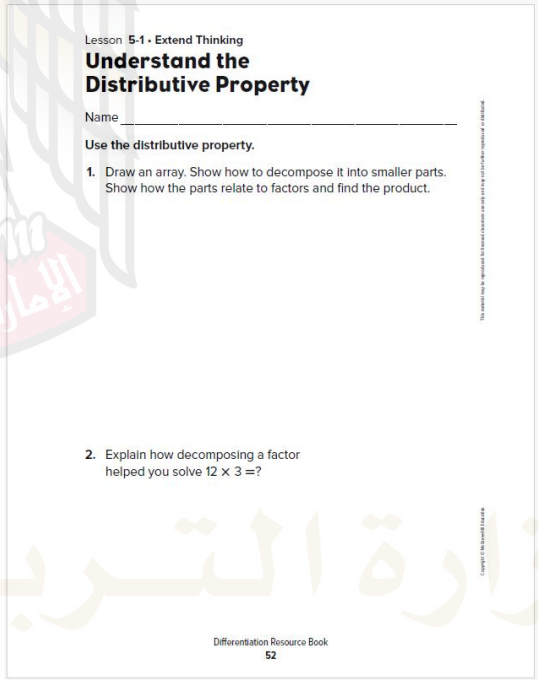
- ☐ Addition
- ☐ Subtraction
- ☐ Multiplication

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5-1 Understand the Distributive Property

Learning Objectives

Students should be able to: Demonstrate an understanding of the Distributive Property.

Towards Mastery	Mastery	Beyond Mastery
		📣 **Wrap-Up Discussion:** How does the distributive property help break down harder problems? Can you find more than one way to split a rectangle? 

Domain

Operations and Algebraic Thinking

Standards

3.OA.B.5
Apply properties of operations as strategies to multiply and divide.2

SMPs

MPs 7,8

Key Vocabulary

Array
Decompose
Multiplication
Product
Analyz
Strategy

Basic Numeracy Skills

- ☐ Addition
- ☐ Subtraction
- ☐ Multiplication

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5-2 Use Properties to Multiply by 3

Learning Objectives

Students should be able to: Apply the properties of multiplication to recall 3s facts.

Towards Mastery

- **Students will understand multiplication as repeated addition by creating equal groups of 3 using real objects.**

Student Activity: "Group It with 3!"

Materials:

- 15 small counters
- Pencil and worksheet
- or notebook for recording



Instructions:

Make Equal Groups

Use your counters to make as many groups of 3 as you can.

Count and Record

Count how many full groups you made.

Write a multiplication sentence to match.

Example: *5 groups of 3 = 15 → 3 × 5 = 15*

Try Again

Choose a different number of counters (e.g., 6, 9, or 12).

Group them by 3 and write a new equation each time.

Wrap-Up Questions:

"What does each number in your multiplication sentence represent?"

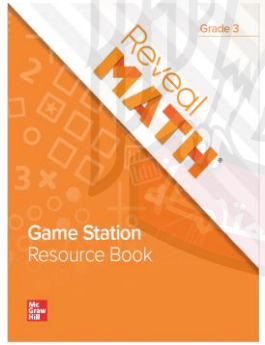
"How did grouping help you find the total quickly?"

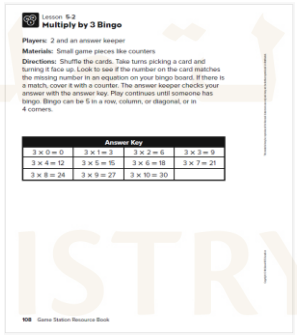
Mastery

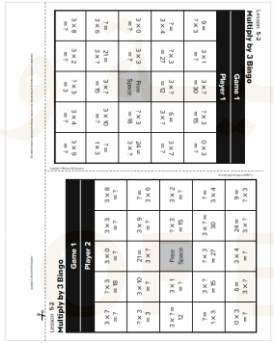
- **Students will apply the properties of multiplication to recall 3s facts.**

Student Activity: Multiply by 3 Bingo

- Answer **Multiply by 3 Bingo** in Game Station Resource Book Pages 108 to 111







Beyond Mastery

- **Students will fluently and accurately apply the properties of multiplication to recall 3s facts.**

Student Activity: "3s Property Puzzle Race"

Materials Needed:

Number tiles or digit cards (1–10)

Pencils and colored markers

Challenge task cards (optional)



Instructions:

Warm-Up Recall Race

Challenge: Write as many multiplication facts for **3s** as you can in 2 minutes.

Example: 3×1 = 3, 3×2 = 6, ..., 3×10 = 30

Puzzle It with Properties

Each student or pair picks a **3s fact** and rewrites it using **3 different multiplication properties**:

Commutative: 3 × 4 = 4 × 3

Associative: (1 × 3) × 4 = 1 × (3 × 4)

Distributive: 3 × 7 = (3 × 5) + (3 × 2)

Create a Math Puzzle Card

Students design a **puzzle card** that includes:

A multiplication fact with **part of it missing**

A visual or clue (e.g., array, bar model, color-coded expression)

A hint: "Use a property of multiplication to find the answer!"

Example Card:

"**? × 3 = 21** – I used the commutative property on 3 × 7."

Domain

Operations and Algebraic Thinking

Standards

3.OA.C.7

Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division

SMPs

MPs 5,7

Key Vocabulary

Array
Discuss
Decompose
Product
Create
Strategy

Basic Numeracy Skills

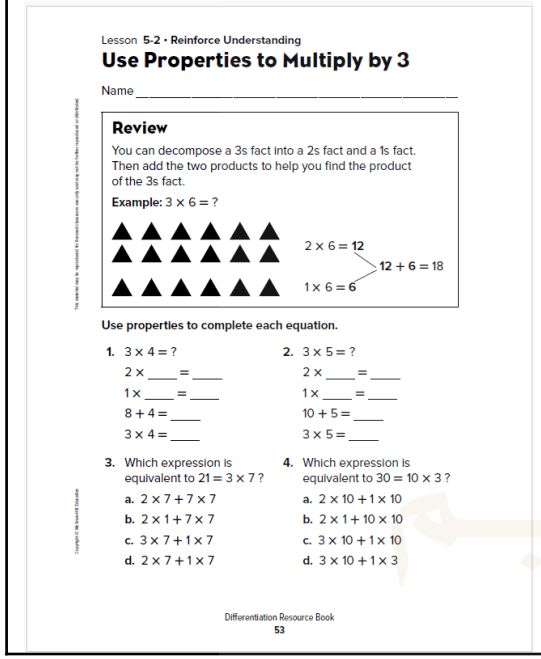
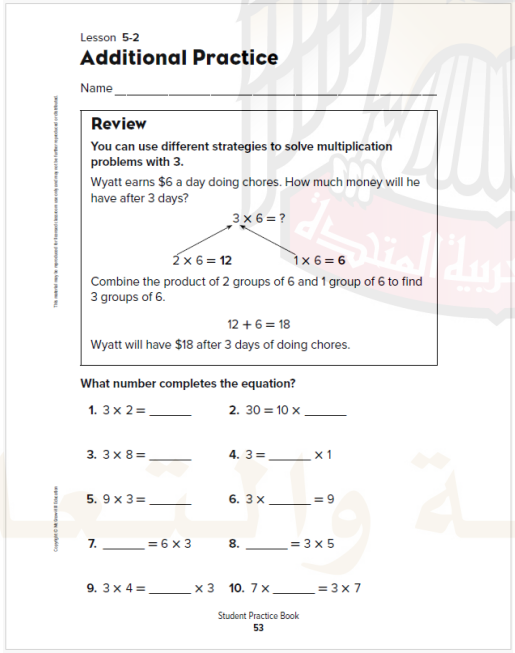
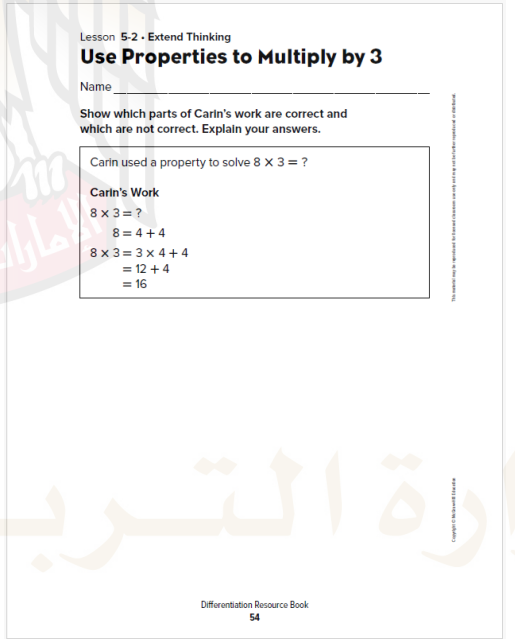
- ☐ Addition
- ☐ Subtraction
- ☐ Multiplication

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5-2 Use Properties to Multiply by 3

Learning Objectives

Students should be able to: Apply the properties of multiplication to recall 3s facts.

Towards Mastery	Mastery	Beyond Mastery
		💬 **Wrap-Up Prompts:** "How do the properties help you remember 3s facts faster?" "Which property do you use most when solving mentally?" 

Domain

Operations and Algebraic Thinking

Standards

3.OA.C.7
Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division

SMPs

MPs 5,7

Key Vocabulary

Array
Discuss
Decompose
Product
Create
Strategy

Basic Numeracy Skills

- ☐ Addition
- ☐ Subtraction
- ☐ Multiplication

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5-3 Use Properties to Multiply by 4

Learning Objectives

Students should be able to: Apply the properties of multiplication to recall 4s facts.

Towards Mastery

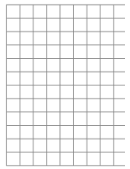
- **Students will apply what you know about 2s facts to help you understand and solve 4s facts**

Student Activity: Double It with Arrays!

Materials Needed:

Grid paper
Number cube (dice)





Instructions:

Roll and Record

Roll a number cube. Write the number you rolled.

Multiply by 2 and 4

Write these two equations:

2 × ___ = ?

4 × ___ = ?

Draw a 2s Array

On your grid paper, draw an array to show your 2s multiplication (e.g., 2 × 5 = 10).

Double the Array

Next to your first array, draw the same array again to make a bigger one.

Now you have a full 4s array!

Color the Arrays

Shade the first 2s array with one color

Shade the second 2s array with a second color

Use a third color to outline the whole 4s array

Write Equations

Write the two 2s facts and the full 4s fact.

Example:

2 × 5 = 10

2 × 5 = 10

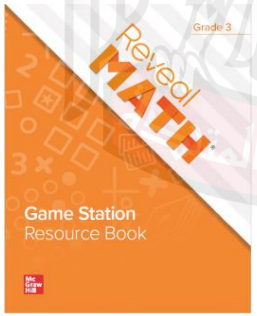
10 + 10 = 20 → 4 × 5 = 20

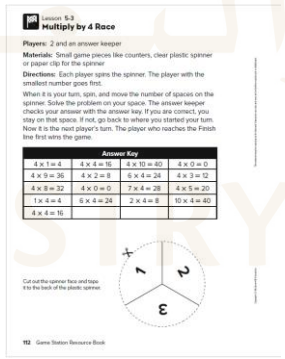
Mastery

- **Students will apply the properties of multiplication to recall 4s facts.**

Student Activity: Multiply by 4 Race

- Answer **Multiply by 4 Race** in Game Station Resource Book Pages 112 to 113







Beyond Mastery

- **Use your knowledge of multiplication properties to build, explain, and connect 4s facts using multiple strategies.**

Student Activity: "4s Fact Architect!"

Materials Needed:

Grid paper or math notebook
Colored pencils or markers
Number tiles (1–12) or dice
Equation cards (optional



Instructions:

Pick or Roll a Number

Choose a number between 1 and 12. This is your multiplier for 4.

Example: 4 × 7

Solve It Three Ways

Show how to solve the fact in **three different ways** using properties:

Distributive Property: Break apart one factor

Example: 4 × 7 = (4 × 5) + (4 × 2)

Doubling Strategy: Use a 2s fact and double the product

Example: 4 × 7 = 2 × 7 = 14 → 14 + 14 = 28

Commutative Property: Flip the factors

Example: 4 × 7 = 7 × 4

Represent It Visually

Draw one **array** and one **bar model** for your chosen fact.

Explain Your Thinking

Write or present how each strategy helped you reach the same product. Use math vocabulary like *factors*, *products*, *properties*, and *arrays*.

Domain

Operations and Algebraic Thinking

Standards

3.OA.C.7
Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division

SMPs

MPs 7,8

Key Vocabulary

Array
Decompose
Product
Process
Summarize

Basic Numeracy Skills

- ☐ Addition
- ☐ Subtraction
- ☐ Multiplication

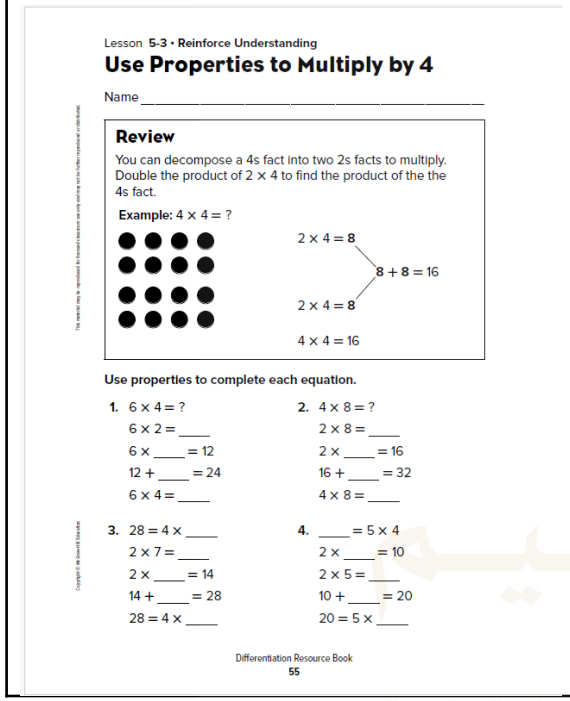
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5-3 Use Properties to Multiply by 4

Learning Objectives

Students should be able to: Apply the properties of multiplication to recall 4s facts.

Towards Mastery	Mastery	Beyond Mastery
Quick Reflection: What did you notice about 2s and 4s? How does doubling help you solve 4s facts faster?		**Wrap-Up Questions:** Which property helped you solve the fastest? How do these properties help you understand multiplication more deeply?



Lesson 5-3 • Reinforce Understanding

Use Properties to Multiply by 4

Name _____

Review

You can decompose a 4s fact into two 2s facts to multiply. Double the product of 2 × 4 to find the product of the the 4s fact.

Example: 4 × 4 = ?

2 × 4 = 8

8 + 8 = 16

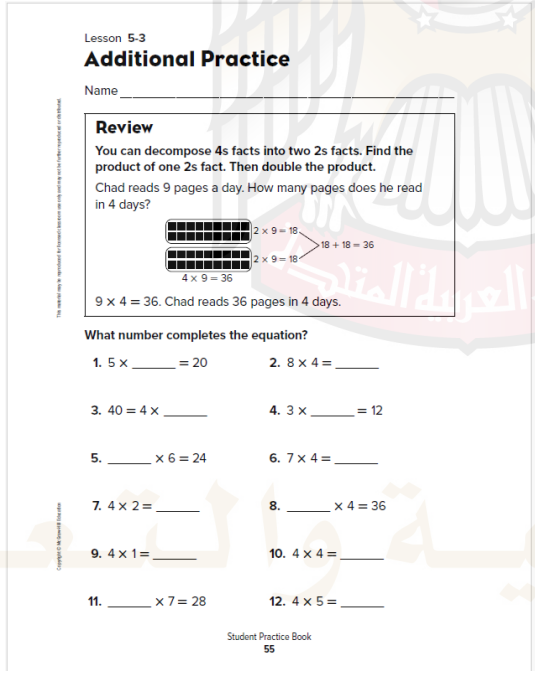
2 × 4 = 8

4 × 4 = 16

Use properties to complete each equation.

1. 6 × 4 = ?
   6 × 2 = ____
   6 × ____ = 12
   12 + ____ = 24
   6 × 4 = ____
2. 4 × 8 = ?
   2 × 8 = ____
   2 × ____ = 16
   16 + ____ = 32
   4 × 8 = ____
3. 28 = 4 × ____
   2 × 7 = ____
   2 × ____ = 14
   14 + ____ = 28
   28 = 4 × ____
4. ____ = 5 × 4
   2 × ____ = 10
   2 × 5 = ____
   10 + ____ = 20
   20 = 5 × ____

Differentiation Resource Book
55



Lesson 5-3

Additional Practice

Name _____

Review

You can decompose 4s facts into two 2s facts. Find the product of one 2s fact. Then double the product.

Chad reads 9 pages a day. How many pages does he read in 4 days?

2 × 9 = 18

2 × 9 = 18

18 + 18 = 36

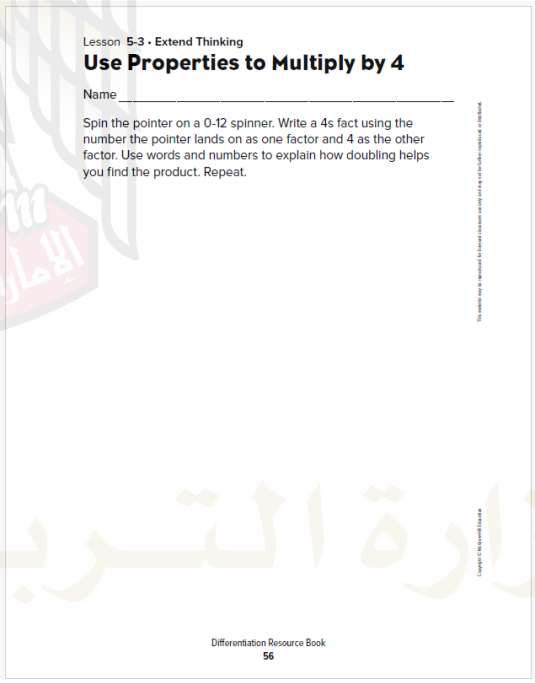
4 × 9 = 36

9 × 4 = 36. Chad reads 36 pages in 4 days.

What number completes the equation?

1. 5 × _____ = 20
2. 8 × 4 = _____
3. 40 = 4 × _____
4. 3 × _____ = 12
5. _____ × 6 = 24
6. 7 × 4 = _____
7. 4 × 2 = _____
8. _____ × 4 = 36
9. 4 × 1 = _____
10. 4 × 4 = _____
11. _____ × 7 = 28
12. 4 × 5 = _____

Student Practice Book
55



Lesson 5-3 • Extend Thinking

Use Properties to Multiply by 4

Name _____

Spin the pointer on a 0-12 spinner. Write a 4s fact using the number the pointer lands on as one factor and 4 as the other factor. Use words and numbers to explain how doubling helps you find the product. Repeat.

Differentiation Resource Book
56

Domain

Operations and Algebraic Thinking

Standards

3.OA.C.7
Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division

SMPs

MPs 7,8

Key Vocabulary

Array
Decompose
Product
Process
Summarize

Basic Numeracy Skills

- ☐ Addition
- ☐ Subtraction
- ☐ Multiplication

Notes/Links

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Resources

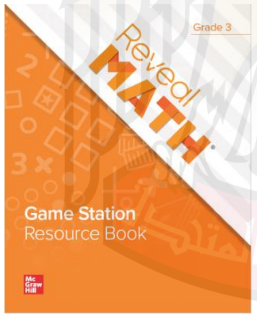
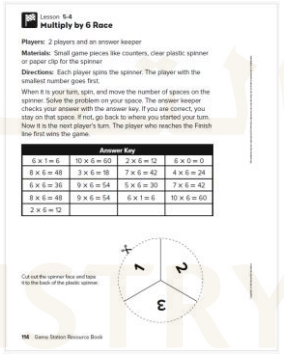
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5-4 Use Properties to Multiply by 6

Learning Objectives

Students should be able to: Apply the properties of multiplication to recall 6s

Towards Mastery	Mastery	Beyond Mastery
• **Apply the Distributive Property to multiply with 6 by breaking apart a factor and modeling with arrays.**	• **Students will apply the properties of multiplication to recall 6s facts.**	• **Apply the properties of multiplication (distributive, associative, commutative) to fluently recall and explain 6s multiplication facts.**
Student Activity: "Build and Break Apart 6 Facts!"	**Student Activity:** Multiply by 6 Race	**Student Activity:** "6s Fact Detective – Solve It 3 Ways!"
Materials: 30 counters per pair 	• Answer **Multiply by 6 Race** in Game Station Resource Book Pages 114 to 115   	**Materials Needed:** Math journal or worksheet Number cards (1–12) 
Instructions:		**Instructions:**
Team Up Work with a partner. You will both share 30 counters.		**Pick a Card, Find the Product** Draw a number card between 1 and 12. Multiply it by 6. Example: If you pick 7 → 6 × 7 = ?
Choose a 6s Fact Pick a multiplication fact that uses 6. Example: 6 × 5 = ?		**Solve It Three Different Ways** Use **three different multiplication properties** to solve the same fact: **Commutative Property**: 6 × 7 = 7 × 6 **Associative Property**: Break 6 into 2 × 3 → (2 × 3) × 7 = 2 × (3 × 7) **Distributive Property**: Break 7 into 5 + 2 → 6 × 7 = (6 × 5) + (6 × 2)
Build an Array Use the counters to make an array that matches your 6s fact (e.g., 6 rows of 5).		**Draw or Model** (Optional) Draw an array or area model to support one of your methods.
Decompose the Other Number Break the second number (e.g., 5) into two smaller parts. Example: 5 = 3 + 2		**Explain Your Thinking** Write 2–3 sentences explaining which strategy helped you most and why.
Rebuild and Model Again Use your counters to build two smaller arrays: 6 × 3 6 × 2 Put them side by side to show the full picture.		
Write and Connect Equations Write all 3 equations: 6 × 5 = 30 6 × 3 = 18 6 × 2 = 12 ➞ 18 + 12 = 30		

Domain

Operations and Algebraic Thinking

Standards

3.OA.C.7

Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division

SMPs

MPs 7,8

Key Vocabulary

Array
Decompose
Product
Comparison
Contrast
Determine

Basic Numeracy Skills

- ☐ Addition
- ☐ Subtraction
- ☐ Multiplication

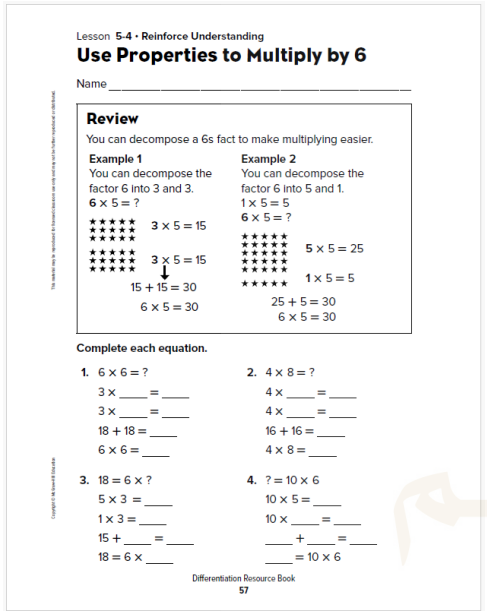
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5-4 Use Properties to Multiply by 6

Learning Objectives

Students should be able to: Apply the properties of multiplication to recall 6s facts.

Towards Mastery	Mastery	Beyond Mastery
• **Explain It** Talk or write about how the two new facts helped you solve the original one. "How do 6 × 3 and 6 × 2 help you understand 6 × 5?"		



Lesson 5-4 • Reinforce Understanding

Use Properties to Multiply by 6

Name _____

Review

You can decompose a 6s fact to make multiplying easier.

Example 1
You can decompose the factor 6 into 3 and 3.
6 × 5 = ?

3 × 5 = 15
3 × 5 = 15
15 + 15 = 30
6 × 5 = 30

Example 2
You can decompose the factor 6 into 5 and 1.
1 × 5 = 5
6 × 5 = ?

5 × 5 = 25
1 × 5 = 5
25 + 5 = 30
6 × 5 = 30

Complete each equation.

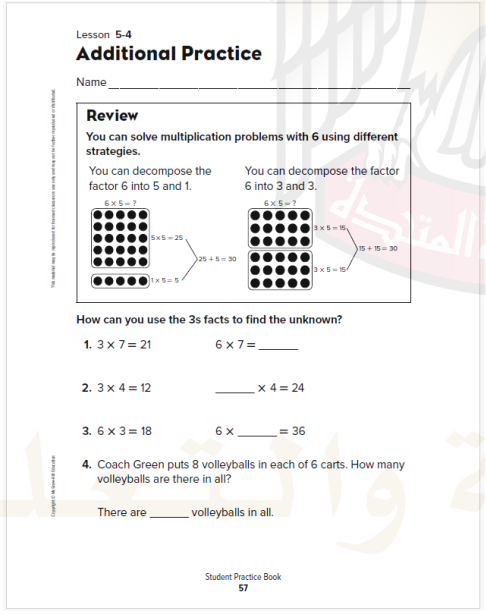
1. 6 × 6 = ?
   3 × ____ = ____
   3 × ____ = ____
   18 + 18 = ____
   6 × 6 = ____

2. 4 × 8 = ?
   4 × ____ = ____
   4 × ____ = ____
   16 + 16 = ____
   4 × 8 = ____

3. 18 = 6 × ?
   5 × 3 = ____
   1 × 3 = ____
   15 + ____ = ____
   18 = 6 × ____

4. ? = 10 × 6
   10 × 5 = ____
   10 × ____ = ____
   ____ + ____ = ____
   ____ = 10 × 6

Differentiation Resource Book
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Lesson 5-4

Additional Practice

Name _____

Review

You can solve multiplication problems with 6 using different strategies.

You can decompose the factor 6 into 5 and 1.

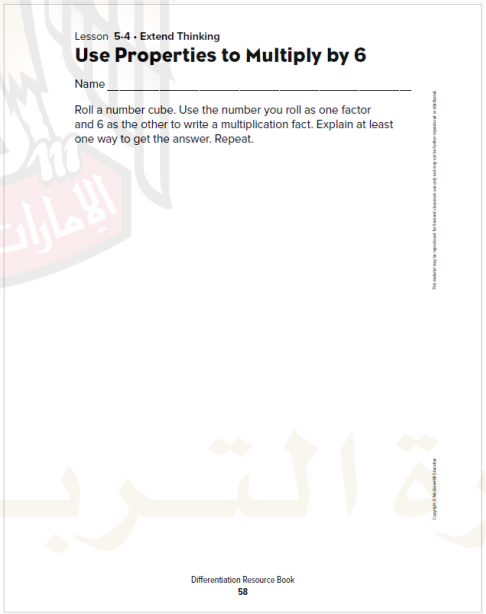
You can decompose the factor 6 into 3 and 3.

How can you use the 3s facts to find the unknown?

1. 3 × 7 = 21 6 × 7 = _____
2. 3 × 4 = 12 _____ × 4 = 24
3. 6 × 3 = 18 6 × _____ = 36
4. Coach Green puts 8 volleyballs in each of 6 carts. How many volleyballs are there in all?

   There are _____ volleyballs in all.

Student Practice Book
57



Lesson 5-4 • Extend Thinking

Use Properties to Multiply by 6

Name _____

Roll a number cube. Use the number you roll as one factor and 6 as the other to write a multiplication fact. Explain at least one way to get the answer. Repeat.

Differentiation Resource Book
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Domain
Operations and Algebraic Thinking

Standards
3.OA.C.7
Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division

SMPs
MPs 7,8

Key Vocabulary
Array
Decompose
Product
Comparison
Contrast
Determine

Basic Numeracy Skills

- ☐ Addition
- ☐ Subtraction
- ☐ Multiplication

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5-5 Use Properties to Multiply by 8

Learning Objectives

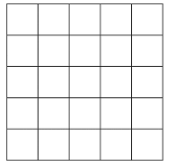
Students should be able to: Apply the properties of multiplication to recall 8s facts.

Towards Mastery

- **Students will recall and apply multiplication facts for 8 fluently through a fun and engaging game.**

Student Activity: "Three in a Row – 8s Fact Game!"

Materials:



- Grid paper with
- a 5 × 5 square drawn
- List of 8s multiplication facts (optional helper chart)

Instructions:

Prepare the Game Board

Work with a partner. Get a 5 × 5 grid. Each player fills the 25 squares with products from the 8s multiplication facts (e.g., 8, 16, 24, … 96). You can repeat some.

Play the Game

Your teacher will say an 8s multiplication fact (e.g., "8 × 6").

The first person to shout the correct answer (e.g., "48") gets to color in one square that has that product.

Win the Game

The first player to color **three squares in a row** (horizontally, vertically, or diagonally) wins!

Wrap-Up Question:

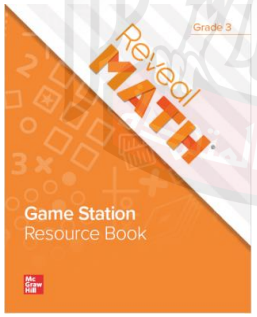
How did practicing the 8s facts in a game help you remember them faster?

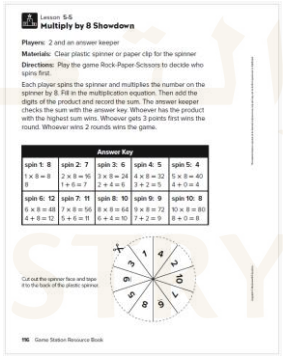
Mastery

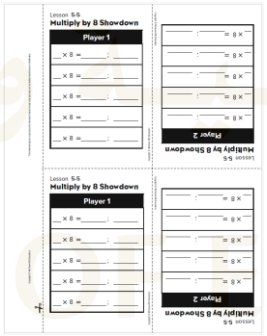
- **Students will apply the properties of multiplication to recall 8s facts.**

Student Activity: Multiply by 8 Showdown

- Answer **Multiply by 8 Showdown** in Game Station Resource Book Pages 116 to 118







Beyond Mastery

- **Apply multiplication properties (distributive, associative, and commutative) to fluently recall and justify 8s multiplication facts.**

Student Activity: "8s Fact Strategy Sort!"

Materials:

Set of number cards (8s facts: 8 × 1 to 8 × 12)

Strategy cards labeled:

"Use Double Twice"
"Break Apart the Number"
"Flip the Factors"
"Group with 4s"
"Array It!"

Instructions:

Draw an 8s Fact

Choose a multiplication card (e.g., 8 × 6).

Choose a Strategy

Pick a **strategy card** that helps you solve the fact efficiently.

For example:

"Use Double Twice": 8 × 6 → Double 6 = 12 → Double again = 24 → Again = 48

"Break Apart the Number": 8 × 6 = (8 × 3) + (8 × 3)

Solve & Record

Write the equation using your chosen strategy.

Explain how that strategy helped and which property it used (commutative, associative, distributive).

Repeat & Reflect

Try a different fact and use a **new strategy**. See which ones you find easiest or most powerful.

Domain

Operations and Algebraic Thinking

Standards

3.OA.C.7

Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division

SMPs

MPs 7

Key Vocabulary

Decompose
Product
Discuss
strategy

Basic Numeracy Skills

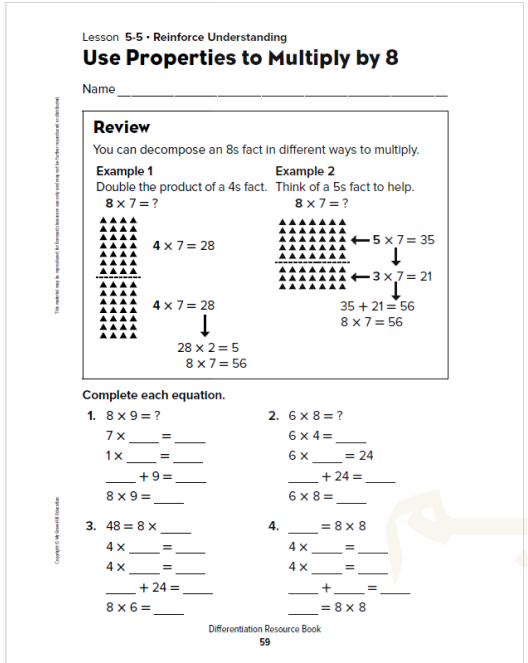
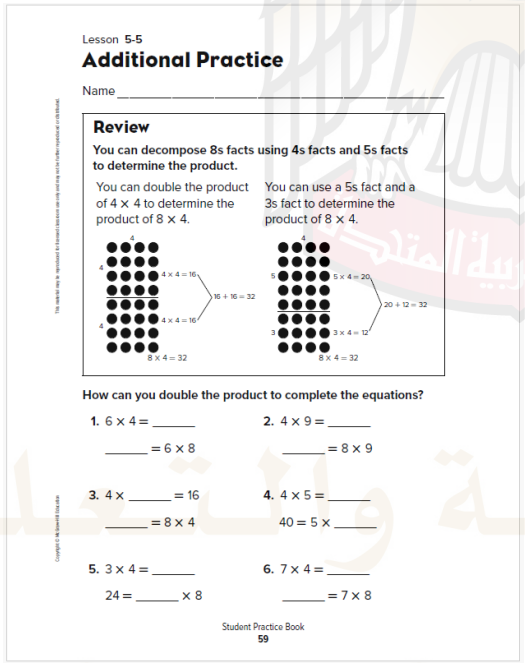
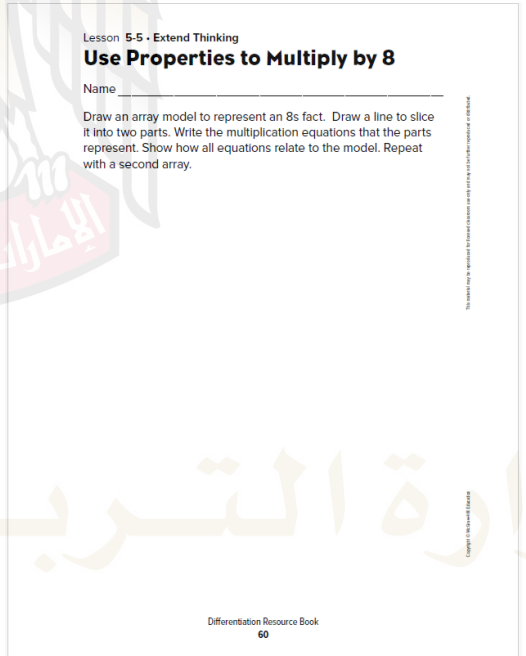
- ☐ Addition
- ☐ Subtraction
- ☐ Multiplication

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5-5 Use Properties to Multiply by 8

Learning Objectives

Students should be able to: Apply the properties of multiplication to recall 8s facts.

Towards Mastery	Mastery	Beyond Mastery
		**Challenge** Can you solve one fact using **two different properties**? Which way was quicker? ✍️ **Extension Prompt for Discussion or Journal:** How can using different properties help you solve bigger problems faster in the future? 

Domain

Operations and Algebraic Thinking

Standards

3.OA.C.7
Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division

SMPs

MPs 7

Key Vocabulary

Decompose
Product
Discuss
strategy

Basic Numeracy Skills

- ☐ Addition
- ☐ Subtraction
- ☐ Multiplication

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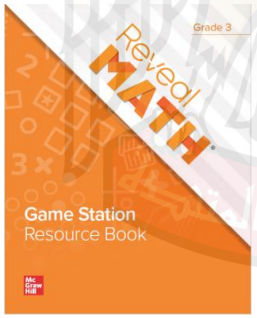
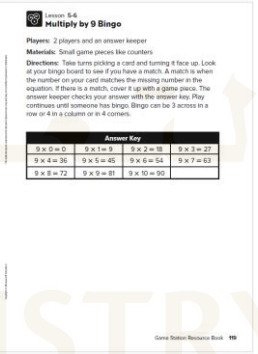
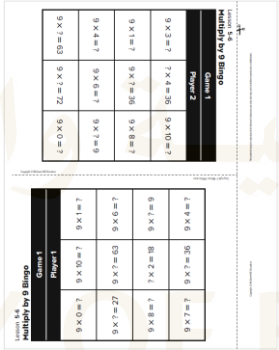
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5-6 Use Properties to Multiply by 7 and 9

Learning Objectives

Students should be able to: Apply the properties of multiplication to recall 7s and 9s facts.

Towards Mastery	Mastery	Beyond Mastery
• **Students will apply the properties of multiplication to understand and recall 7s and 9s facts.** **Student Activity**: "Find Your Match – 7s Edition" **Materials:** Pre-made cards with: A multiplication fact with 7 (e.g., 7 × 4) The same fact with 7 decomposed (e.g., (5 + 2) × 4) The distributive form (e.g., (5 × 4) + (2 × 4)) The final product (e.g., 28) **Instructions:** **Get a Card** Each student gets **one card** — it might be an equation, a decomposed version, a distributive property equation, or a product. **Move and Match** Walk around the room to find **the other 3 cards** that match yours. Together, your group should have: One multiplication expression (e.g., 7 × 4) A decomposed form (e.g., 5 + 2 × 4) A distributive form (e.g., 5 × 4 + 2 × 4) The product (e.g., 28) **Check and Explain** Sit with your group and explain how each card is connected. Share how the distributive property helped solve the fact.	• **Students will apply the properties of multiplication to recall 7s and 9s facts.** • **Student Activity:** Multiply by 9 Bingo • Answer **Multiply by 9 Bingo** in Game Station Resource Book Pages 119 to 122   	• **Students will apply the properties of multiplication (Distributive, Associative, and Commutative) to recall and reason with 7s and 9s facts.** **Student Activity**: "Multiplication Maze: Path to the Product" **Materials:** • Multiplication maze worksheet (custom grid with fact clues using 7s and 9s) • Pencils and highlighters • Scratch paper for modeling strategies • Strategy cards (optional: showing distributive, associative, and commutative properties) **Instructions:** **Start at the Maze Entrance** Students begin at the top-left corner of a multiplication maze. Each square contains a number — but only paths with correct **products of 7 or 9** facts can be followed. **Solve with Strategy** To move forward, students must **justify** the multiplication fact using one of the multiplication properties (e.g., 9 × 6 → (10 × 6) - (1 × 6) using distributive). **Explain the Route** As they navigate, they record the equation, the property used, and the reasoning behind the choice. If a square shows 63, they might write: **7 × 9 = 63** **Used commutative: 9 × 7 = 7 × 9**

Domain
Operations and Algebraic Thinking

Standards
3.OA.C.9
Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division

SMPs
MPs 7

Key Vocabulary
Array
Decompose
Product
Analyz
Investigate

Basic Numeracy Skills

- ☐ Addition
- ☐ Subtraction
- ☐ Multiplication

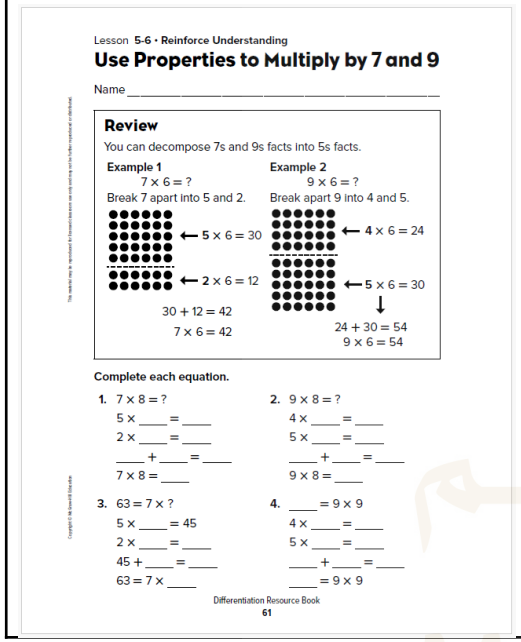
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5-6 Use Properties to Multiply by 7 and 9

Learning Objectives

Students should be able to: Apply the properties of multiplication to recall 7s and 9s facts.

Towards Mastery	Mastery	Beyond Mastery



Lesson 5-6 • Reinforce Understanding

Use Properties to Multiply by 7 and 9

Name _____

Review

You can decompose 7s and 9s facts into 5s facts.

Example 1

7 × 6 = ?

Break 7 apart into 5 and 2.

← 5 × 6 = 30

← 2 × 6 = 12

30 + 12 = 42

7 × 6 = 42

Example 2

9 × 6 = ?

Break apart 9 into 4 and 5.

← 4 × 6 = 24

← 5 × 6 = 30

↓

24 + 30 = 54

9 × 6 = 54

Complete each equation.

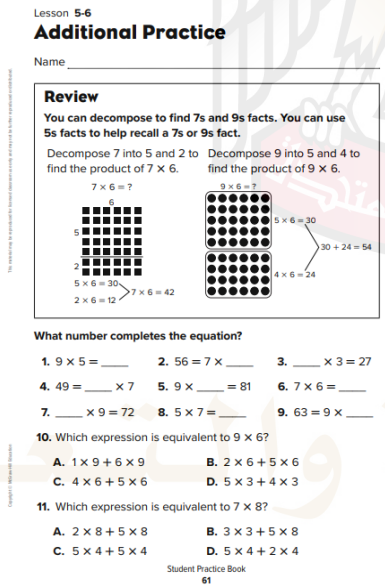
1. 7 × 8 = ?
   5 × ____ = ____
   2 × ____ = ____
   ____ + ____ = ____
   7 × 8 = ____

2. 9 × 8 = ?
   4 × ____ = ____
   5 × ____ = ____
   ____ + ____ = ____
   9 × 8 = ____

3. 63 = 7 × ?
   5 × ____ = 45
   2 × ____ = ____
   45 + ____ = ____
   63 = 7 × ____

4. ____ = 9 × 9
   4 × ____ = ____
   5 × ____ = ____
   ____ + ____ = ____
   ____ = 9 × 9

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Lesson 5-6

Additional Practice

Name _____

Review

You can decompose to find 7s and 9s facts. You can use 5s facts to help recall a 7s or 9s fact.

Decompose 7 into 5 and 2 to find the product of 7 × 6.

7 × 6 = ?

6

5

2

5 × 6 = 30

2 × 6 = 12

7 × 6 = 42

Decompose 9 into 5 and 4 to find the product of 9 × 6.

9 × 6 = ?

5 × 6 = 30

30 + 24 = 54

4 × 6 = 24

What number completes the equation?

1. 9 × 5 = ____
2. 56 = 7 × ____
3. ____ × 3 = 27
4. 49 = ____ × 7
5. 9 × ____ = 81
6. 7 × 6 = ____
7. ____ × 9 = 72
8. 5 × 7 = ____
9. 63 = 9 × ____
10. Which expression is equivalent to 9 × 6?
    A. 1 × 9 + 6 × 9
    B. 2 × 6 + 5 × 6
    C. 4 × 6 + 5 × 6
    D. 5 × 3 + 4 × 3
11. Which expression is equivalent to 7 × 8?
    A. 2 × 8 + 5 × 8
    B. 3 × 3 + 5 × 8
    C. 5 × 4 + 5 × 4
    D. 5 × 4 + 2 × 4

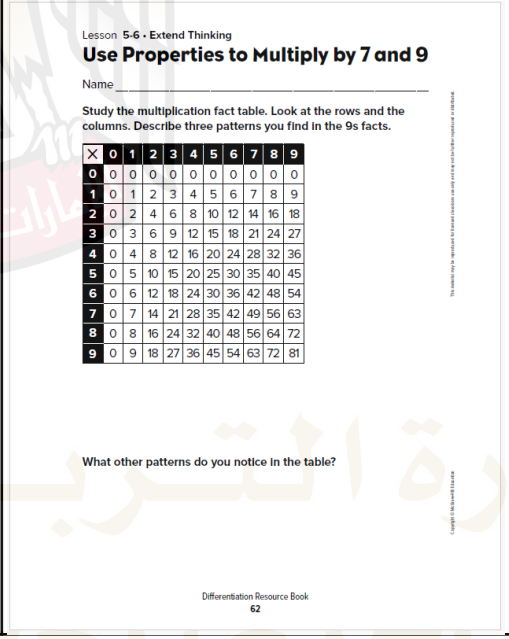
Student Practice Book
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Reach the End

Only by using **strategic multiplication facts with reasoning** can students reach the end of the maze.

Wrap-Up Challenge:

Can you create your own maze or pattern using 7s and 9s facts and explain the strategies someone could use to solve it?



Lesson 5-6 • Extend Thinking

Use Properties to Multiply by 7 and 9

Name _____

Study the multiplication fact table. Look at the rows and the columns. Describe three patterns you find in the 9s facts.

×	0	1	2	3	4	5	6	7	8	9
0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	3	4	5	6	7	8	9
2	0	2	4	6	8	10	12	14	16	18
3	0	3	6	9	12	15	18	21	24	27
4	0	4	8	12	16	20	24	28	32	36
5	0	5	10	15	20	25	30	35	40	45
6	0	6	12	18	24	30	36	42	48	54
7	0	7	14	21	28	35	42	49	56	63
8	0	8	16	24	32	40	48	56	64	72
9	0	9	18	27	36	45	54	63	72	81

What other patterns do you notice in the table?

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Domain

Operations and Algebraic Thinking

Standards

3.OA.C.9

Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations

SMPs

MPs 7

Key Vocabulary

Array
Decompose
Product
Analyz
Investigate

Basic Numeracy Skills

- ☐ Addition
- ☐ Subtraction
- ☐ Multiplication

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5-7 Solve Problems Using Arrays

Learning Objectives

- Students should be able to: Represent a problem with arrays and an equation.
- Use arrays and properties of multiplication to solve an equation.

Towards Mastery

- **Students will apply and explain multiplication facts (3, 4, 6, 7, 8, or 9) using expressions, arrays, and products.**

Student Activity: "Multiplication Match-Up!"

Materials:

- Index cards with:
- Multiplication expressions (e.g., 6 × 3)
- Matching arrays (e.g., 3 rows of 6)
- Products (e.g., 18)

Instructions:

Pick and Look

You will see many cards on the table — some have multiplication expressions, some have array pictures, and some show numbers (products).

Find Your Set

Work with your group to find **3 cards** that belong together:

- A multiplication expression
- A matching array
- The correct product

Explain Your Match

Once you find a set, explain why they match:

"We chose 6 × 3 because this array shows 3 rows of 6, and the product is 18!"

Repeat & Share

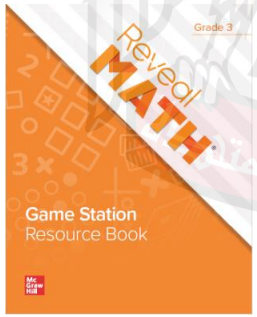
Try to find more sets and share with your classmates. Get ready to explain how you know your answers are correct!

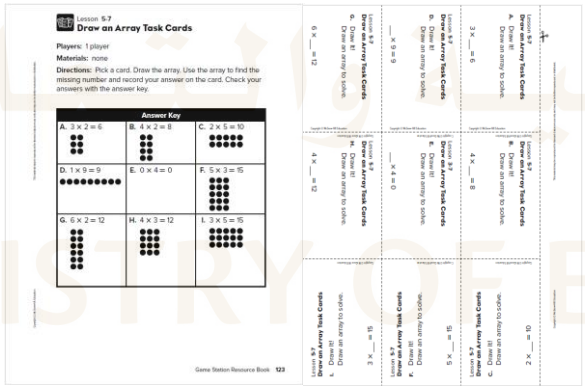
Mastery

- **Students will represent a problem with arrays and an equation.**
- **Use arrays and properties of multiplication to solve an equation.**

Student Activity: Draw an Array Task Cards

- Answer **Draw an Array Task Cards** in Game Station Resource Book Pages 123 to 124





Beyond Mastery

- **Students will fluently represent a problem with arrays and an equation.**
- **Use arrays and properties of multiplication to accurately solve an equation.**

Student Activity: "Array Architect Challenge!"

Materials:

- Grid paper or whiteboards
- Word problem cards (or teacher-provided scenarios)
- Multiplication property cards (e.g., Distributive, Commutative, Associative)

Instructions:

Pick a Scenario

Draw or select a real-world scenario card (e.g., "There are 4 shelves with 6 books on each").

Design Your Array

On grid paper, draw an **array** to model the problem. Label the rows and columns clearly.

Write the Equation

Write the multiplication equation that matches your array (e.g., 4 × 6 = 24).

Apply a Property

Choose a multiplication property card. Use it to rewrite or break apart your equation in a new way (e.g., 4 × 6 = (2 × 6) + (2 × 6)) and explain your thinking.

Present Your Work

Share your design with a partner or group. Use math vocabulary to explain how the array, equation, and property are connected.

Domain

Operations and Algebraic Thinking

Standards

3.OA.A.3

3.OA.A.4

Determine the unknown whole number in a multiplication or division equation relating three whole numbers.

SMPs

MPs 7

Key Vocabulary

Array
Decompose
Product
Unknown
Defend
Investigate

Basic Numeracy Skills

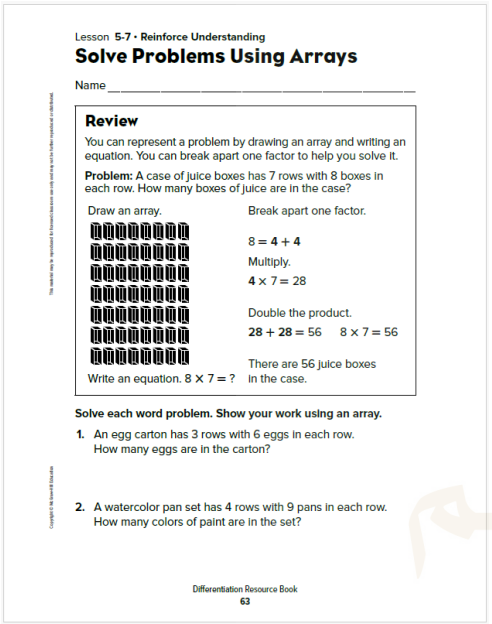
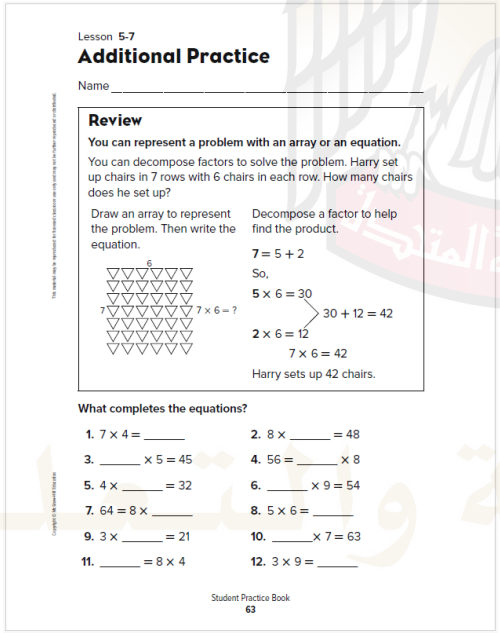
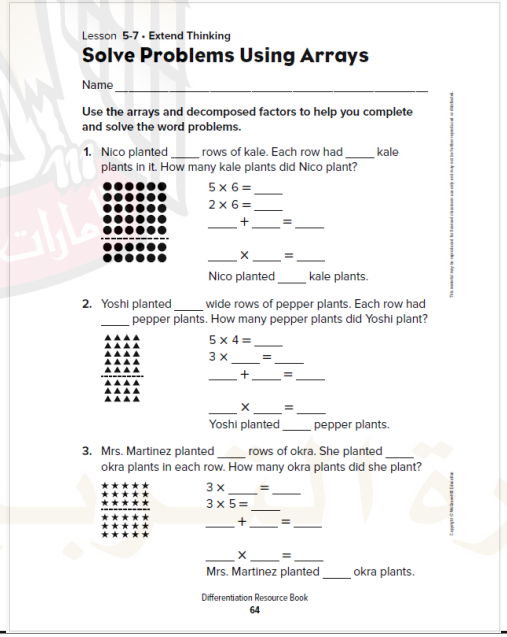
- ☐ Addition
- ☐ Subtraction
- ☐ Multiplication

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5-7 Solve Problems Using Arrays

Learning Objectives

- Students should be able to: Represent a problem with arrays and an equation.
- Use arrays and properties of multiplication to solve an equation.

Towards Mastery	Mastery	Beyond Mastery
		**Extension:** Challenge students to **create their own real-world multiplication story**, draw an array, write two equations (original and with a property), and exchange it with another group to solve. 

Lesson 5-7 • Reinforce Understanding

Solve Problems Using Arrays

Name _____

Review

You can represent a problem by drawing an array and writing an equation. You can break apart one factor to help you solve it.

Problem: A case of juice boxes has 7 rows with 8 boxes in each row. How many boxes of juice are in the case?

Draw an array.

Break apart one factor.

$8 = 4 + 4$

Multiply.

$4 \times 7 = 28$

Double the product.

$28 + 28 = 56$ $8 \times 7 = 56$

There are 56 juice boxes in the case.

Write an equation. $8 \times 7 = ?$

Solve each word problem. Show your work using an array.

1. An egg carton has 3 rows with 6 eggs in each row. How many eggs are in the carton?

2. A watercolor pan set has 4 rows with 9 pans in each row. How many colors of paint are in the set?

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Lesson 5-7

Additional Practice

Name _____

Review

You can represent a problem with an array or an equation.

You can decompose factors to solve the problem. Harry set up chairs in 7 rows with 6 chairs in each row. How many chairs does he set up?

Draw an array to represent the problem. Then write the equation.

6, 7, $7 \times 6 = ?$

Decompose a factor to help find the product.

$7 = 5 + 2$

So,

$5 \times 6 = 30$

$30 + 12 = 42$

$2 \times 6 = 12$

$7 \times 6 = 42$

Harry sets up 42 chairs.

What completes the equations?

1. $7 \times 4 =$ _____
2. $8 \times$ _____ $= 48$
3. _____ $\times 5 = 45$
4. $56 =$ _____ $\times 8$
5. $4 \times$ _____ $= 32$
6. _____ $\times 9 = 54$
7. $64 = 8 \times$ _____
8. $5 \times 6 =$ _____
9. $3 \times$ _____ $= 21$
10. _____ $\times 7 = 63$
11. _____ $= 8 \times 4$
12. $3 \times 9 =$ _____

Student Practice Book 63

Lesson 5-7 • Extend Thinking

Solve Problems Using Arrays

Name _____

Use the arrays and decomposed factors to help you complete and solve the word problems.

1. Nico planted ____ rows of kale. Each row had ____ kale plants in it. How many kale plants did Nico plant?

$5 \times 6 =$ ____

$2 \times 6 =$ ____

____ + ____ = ____

____ × ____ = ____

Nico planted ____ kale plants.

2. Yoshi planted ____ wide rows of pepper plants. Each row had ____ pepper plants. How many pepper plants did Yoshi plant?

$5 \times 4 =$ ____

$3 \times$ ____ = ____

____ + ____ = ____

____ × ____ = ____

Yoshi planted ____ pepper plants.

3. Mrs. Martinez planted ____ rows of okra. She planted ____ okra plants in each row. How many okra plants did she plant?

$3 \times$ ____ = ____

$3 \times 5 =$ ____

____ + ____ = ____

____ × ____ = ____

Mrs. Martinez planted ____ okra plants.

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Domain
Operations and Algebraic Thinking

Standards
3.OA.A.3
3.OA.A.4
Determine the unknown whole number in a multiplication or division equation relating three whole numbers.

SMPs
MPs 7

Key Vocabulary
Array , Decompose , Product Unknown, Defend Investigate

Basic Numeracy Skills

- ☐ Addition
- ☐ Subtraction
- ☐ Multiplication

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