Mathematics Curriculum

Comprehensive Curriculum Guide

Grade 4 General Reveal

Term 1

2025-2026

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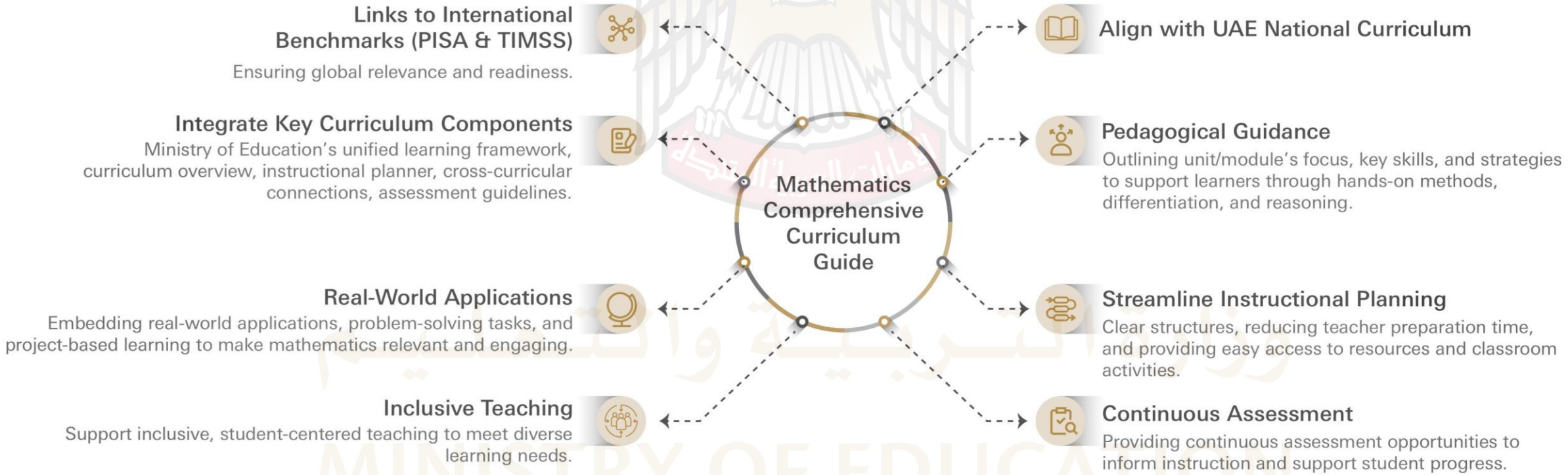
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CCG Overview

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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Overview of EMTPs and SMPs

1. Promotes meaningful understanding over rote memorization.
2. Empowers students to take ownership of their learning.
3. Ensures inclusive and culturally responsive mathematics education.

Conceptual Understanding

Student Empowerment

Equity and Access

EMTPs Enhance Quality Teaching Practice

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

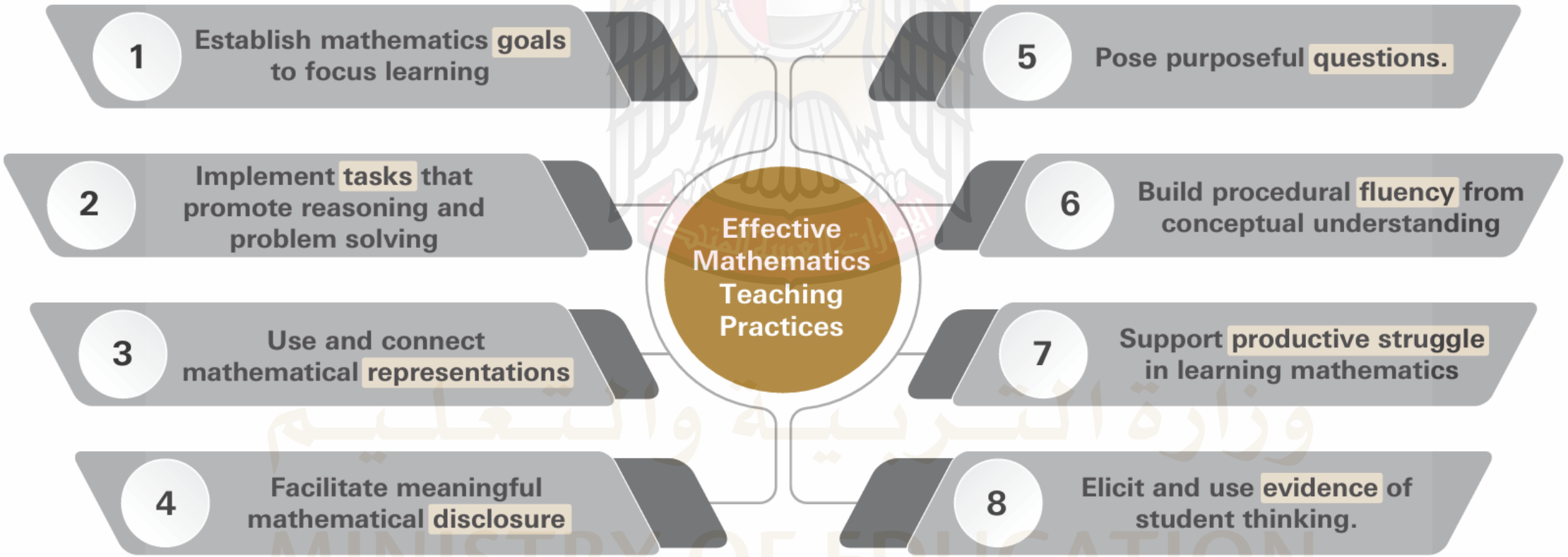
Real-World Application

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.

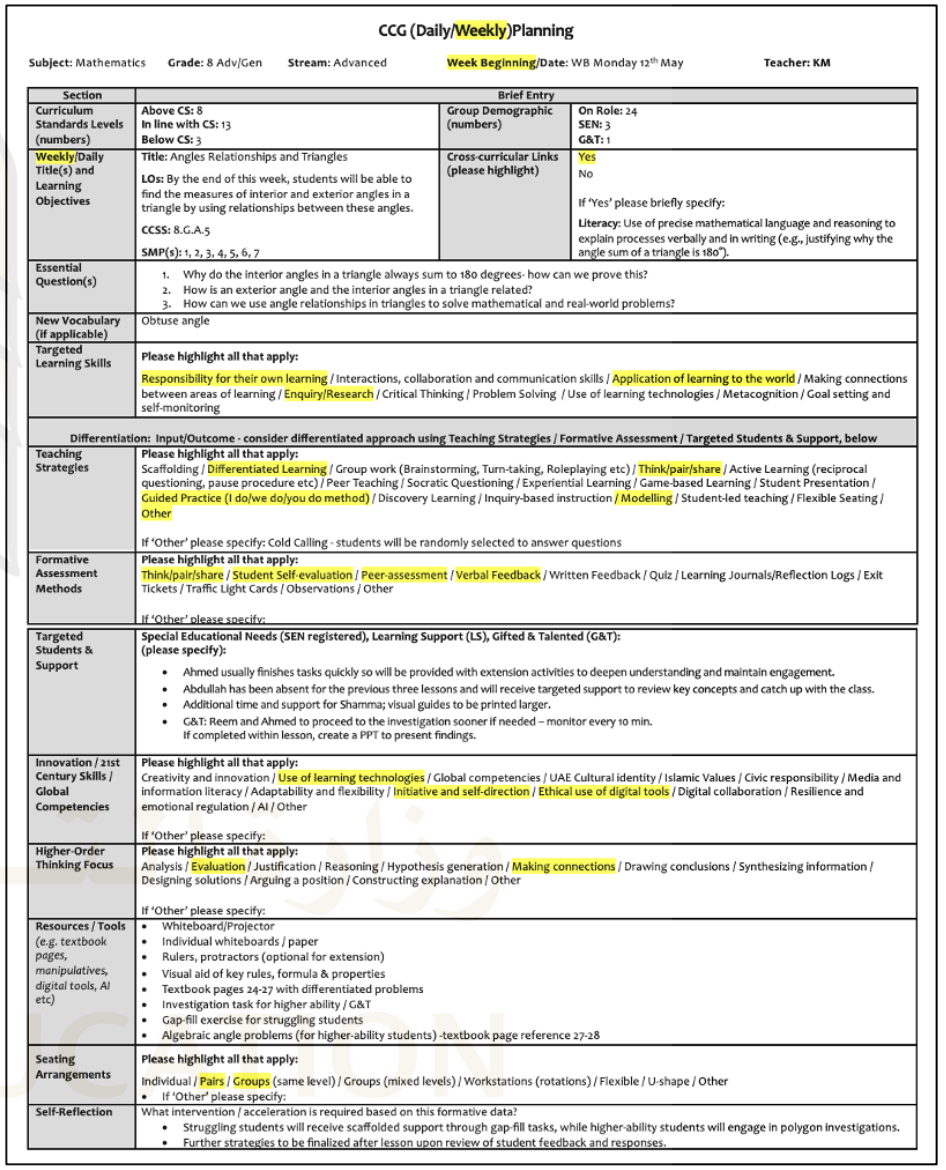
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Lesson Plan Exemplar

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.		

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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.

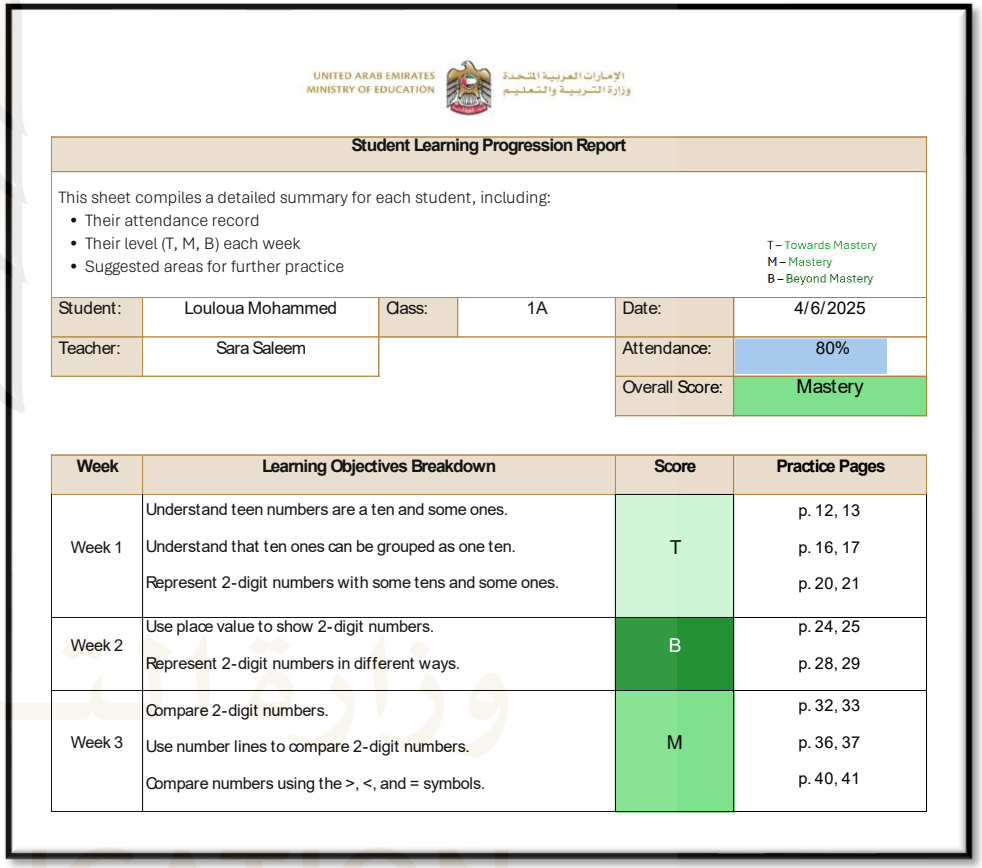
The tool is built around **four** core components:

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 4 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 4 General Mathematics
Scheme of Work, Academic Year 2025-2026

Key Mathematical Understandings				
By the end of Grade 4, students will be able to:				
Operations & Algebraic Thinking (Domain 4.OA)	***Number and Operations in Base Ten (Domain 4.NBT)***	***Numbers and Operations – Fractions (Domain 4.NF)***	***Measurement and Data (Domain 4.MD)***	***Geometry (Domain 4.G)***
• Use the four operations with whole numbers to solve problems. • Gain familiarity with factors and multiples. • Generate and analyze patterns.	• Generalize place value understanding for multi-digit whole numbers. • Use place value understanding and properties of operations to perform multi-digit arithmetic.	• Extend understanding of fraction equivalence and ordering. • Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers. • Understand decimal notation for fractions and compare decimal fractions.	• Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit. • Represent and interpret data. • Geometric measurement: understand concepts of angle and measure angles.	• Draw and identify lines and angles and classify shapes by properties of their lines and angles.

Resources:

Grade 4 Reveal Math Course 1, Teacher Edition e-Book, Volume 1
Grade 4 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 4 General Stream Mathematics

Unit 1 – Math is...	
Page	Topic
17	Overview & Instructional Ideas

Unit 2 – Generalize Place-Value Structure	
Page	Topic
21	Understand the Structure of Multi-Digit Numbers
23	Read and Write Numbers to One Million
25	Compare Multi-Digit Numbers
27	Round Multi-Digit Numbers

Unit 3 – Addition and Subtraction Strategies and Algorithms	
Page	Topic
31	Estimate Sums or Differences
33	Strategies to Add Multi-Digit Numbers
35	Understand an Addition Algorithm
37	Understand an Addition Algorithm Involving Regrouping
39	Strategies to Subtract Multi-Digit Numbers
41	Understand a Subtraction Algorithm
43	Understand a Subtraction Algorithm Involving Regrouping
45	Represent and Solve Multi-Step Problems
47	Solve Multi-Step Problems Involving Addition and Subtraction

Remarks
• **Page numbers** refer to those in the document. • **Scope & Sequence** and **Instructional Planners** are available on the LMS.

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Term 1 Overview
Grade 4 General Stream Mathematics

Unit 4 – Multiplication as Comparison	
Page	Topic
51	Understand Comparing with Multiplication
53	Represent Comparison Problems
55	Solve Comparison Problems Using Multiplication
57	Solve Comparison Problems Using Division

Unit 5 – Numbers and Number Patterns	
Page	Topic
61	Understand Factors of a Number
63	Understand Prime and Composite Numbers
65	Understand Multiples
67	Number or Shape Patterns
69	Generate a Pattern
71	Analyze Features of a Pattern

Unit 6 - Multiplication Strategies with Multi-Digit Numbers	
Page	Topic
75	Multiply by Multiples of 10, 100, or 1,000
77	Estimate Products
79	Use the Distributive Property to Multiply
81	Multiply 2-Digit by 1-Digit Factors
83	Multiply Multi-Digit by 1-Digit Factors
85	Multiply Two Multiples of 10
87	Multiply Two 2-Digit Factors
89	Solve Multi-Step Problems Involving Multiplication

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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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Unit 1 - Math is ...
Learning Objectives & Criteria

Unit Goal:
Help students see the relevance of mathematics in everyday life, develop critical thinking skills, and engage collaboratively in a respectful classroom environment.

Learning Objective (LO)	Common Core State Standard
Discuss students' strengths in math.	3.NF.A.1 Understand a fraction 1/b as the quantity formed by 1 part when a whole is partitioned into b equal parts; understand a fraction a/b as the quantity formed by a parts of size 1/b. 3.NF.A.3 Explain equivalence of fractions in special cases and compare fractions by reasoning about their size. 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. 3.OA.A.3 Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.
Describe a personal math story.	
Discuss approaches for understanding a problem and strategies for solving it.	
Make sense of quantities in a problem and look for connections among quantities.	
Explore ways to show real-world situations and problems with mathematical models.	
Construct arguments to support thinking. Respond to the ideas and arguments of others.	
Explore strategies for uncovering patterns and for using patterns to solve problems.	
Discuss and decide on classroom norms of interaction for a productive math learning environment.	

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Generalize Place-Value Structure

Notes & Guidance

Unit 2
In this unit, students deepen their understanding of the base-ten place value system by working with numbers up to one million. They examine how the value of digits changes depending on their position, starting with 3-digit numbers and extending to 4- and 5-digit numbers. Students recognize that, like how 100 is ten times 10 and 1,000 is ten times 100, each place in a number has a value ten times greater than the place to its right.
They also explore how numbers are grouped in sets of three digits (periods) and learn the names and values of each place within numbers up to one million.

Pedagogy

- **Mathematical Discourse:** Encourage students to explain their reasoning, justify their answers, and engage in peer discussions to deepen conceptual understanding.
- **Spiral Review:** Revisit prior concepts such as hundreds, tens, and ones to ensure a solid foundation before building to larger numbers.
- **Differentiated Instruction:** Provide varied tasks, scaffolds, and challenges to meet the needs of all learners, especially when moving from 3-digit to 6-digit numbers.
- **Formative Assessment and Feedback**: Frequently assess understanding through quick checks, exit tickets, and questioning to guide instruction and clarify misconceptions.

Key Skills & Learning Goals

- ✓ **Read and write numbers** up to 1,000,000 in standard, word, and expanded forms.
- ✓ **Compare and order multi-digit numbers** using place value understanding and symbols (<, >, =)
- ✓ **Understand the relationship between place values,** e.g., a digit in one place is 10 times the digit to its right.
- ✓ **Identify and name place value positions** (e.g., thousands, ten thousands, hundred thousands).
- ✓ **Use place value reasoning** to round multi-digit numbers to any given place.

International Assessment Links

IEA TIMSS **Whole Numbers** Recognize that the value of a digit depends on its place, explain place-to-place relationships in base-10, and use this understanding to read, write, and compare numbers to 6 digits.

PISA **Numbers and Units** Understanding number concepts and systems, including converting between them, recognizing properties of integers, and using numbers to describe real-world quantities.

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Unit 2 - Generalize Place-Value Structure
Learning Objectives & Criteria

Unit Goal:
Extend understanding of the base-ten system by working with numbers up to one million, focusing on place value, number forms, comparison, and rounding.

Learning Objective (LO)	Common Core State Standard	Formative Assessment Criteria
Relate the value of a digit in one place-value position to that of the same digit in the place to its right.	4.NBT.A.1 Recognize that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right. 4.NBT.A.2 Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form. Compare two multi-digit numbers based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons. 4.NBT.A.3 Use place value understanding to round multi-digit whole numbers to any place.	Compare two digits in different place values and state which is 10 times greater.
Determine the value of a digit in any place in a number.		Identify the place and value of a digit in a multi-digit number.
Read and write numbers from 1 to 1,000,000 in standard form, word form, and expanded form.		Identify and write a 6-digit number in all three forms when prompted.
Compare multi-digit numbers using place value and record comparisons using symbols.		Correctly place comparison symbols (< , > , or =) between two multi-digit numbers.
Determine an estimate by rounding numbers to an appropriate place.		Select the most appropriate place value (tens, hundreds, thousands) when rounding to estimate.
Round multi-digit numbers to any place.		Explain the steps used to round a number to a specified place.

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2-1 Understand the Structure of Multi-Digit Numbers

Learning Objectives

Students should be able to:

- Relate the value of a digit in one place-value position to that of the same digit in the place to its right.
- Determine the value of a digit in any place in a number.

Towards Mastery

Recognize that the value of a digit decreases by a factor of ten when it moves one place to the right in a number.

Connect the Dots — Exploring Place Value and Multiplicative Relationships

Preparation Steps:

- Prepare the following 4 numbers on individual sticky notes (1,234 / 2,314 / 2,341 / 3,241 and 3,124). Arrange the numbers in a **circle** "each beside a dot".

Instructions:

- Divide the class intro groups of 3 and provide each group with a **place value chart**.
- They copy the 5 numbers into place value charts.
- Students pick any two numbers from the circle to compare and complete the following sentence: **"The ___ in ___ has a value that is 10 times the value of the ___ in ___."**

Check and Connect:

- Digits must be **the same.**
- The digit in the **first number must be exactly one place to the left of its position in the second number.**
- The value must be **10 times greater.**

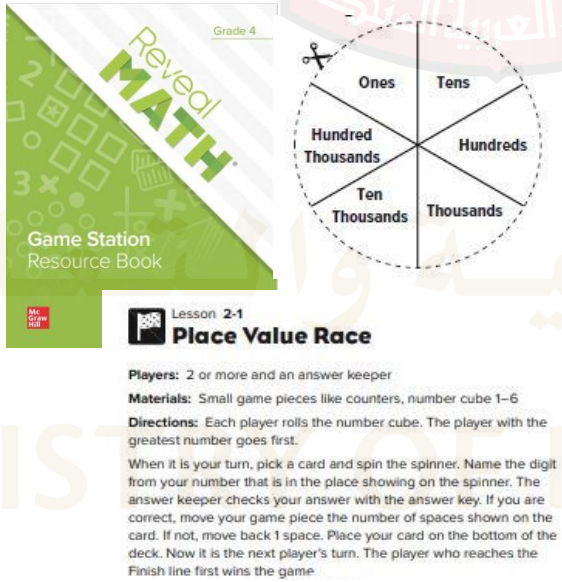
Finally, if both are true, students **connect the two dots** representing those numbers.

Mastery

Accurately determine the value of any digit in a multi-digit number and explain how its value changes based on its place.

Place Value Race (Game Station Activity)

Lesson Reference: Lesson 2-1
Pages: 1 to 3
Source: *Game Station Resource Book*



Beyond Mastery

Deepen understanding of how digit placement affects value in multi-digit numbers.

Place Value Double Race

How to Play:

Part 1: Build the Biggest (or Smallest)

1. In teams or pairs, give students 5–6-digit cards at random.
2. Call out a challenge, such as:
   - **"Make the largest 5-digit number possible using 3 even digits and 2 odd digits."**
3. Students build the number and explain their reasoning using place value understanding.

Part 2: Place Value Riddles

- Give students a riddle to solve:

Example: **"I am a 5-digit number. My digit in the thousands place is 4. My digit in the ten-thousands place is double that. The hundreds digit is 0. The tens digit is 5 less than the thousands digit. The ones digit is 9. What number am I?"**

- Students solve and race to be the first team to get it right. Correct answers earn points or tokens.

Domain
Number and Operations in Base Ten

Standards
4.NBT.A.1 and **4.NBT.A.2**
Understand that each place value is 10 times the one to its right, read and write multi-digit numbers in various forms, and compare them using place value and comparison symbols.

SMPs
MPs : **3** and **7**

Key Vocabulary

- base-10 number
- system
- digit
- expanded form

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2-1 Understand the Structure of Multi-Digit Numbers (cont'd)

Notes / Misconceptions:

❖ Remind students that each place value is **10 times greater** than the place to its **right.**

Resources:

Mastery Level Activity: *Game Station Resource Book* on Reveal platform.

Domain
Number and Operations in Base Ten

Standards
4.NBT.A.1 and **4.NBT.A.2**

SMPs
MPs : **3** and **7**

Key Vocabulary
- base-10 number
- system
- digit
- expanded form

Basic Numeracy Skills

- Break down numbers by place value.
- Order multi-digit numbers.

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2-2 Read and Write Numbers to One Million

Learning Objective
Students should be able to:

- Read and write numbers from 1 to 1,000,000 in standard form, word form, and expanded form.

Towards Mastery

Represent whole numbers using standard notation, word form, and expanded form.

Guess My Number!

Preparation Steps:

- Prepare place value charts (thousands, hundreds, tens, ones) for each student.
- Provide each student with note cards.
- Pair up students in advance.

Instructions:

1. Each student creates a **4–6-digit number** secretly.
2. They give **one clue at a time** about the number's digits using place value **(e.g., "The tens digit is 5")**.
3. Partners try to ***guess the number*** based on the clues. Then, switch roles and repeat.
4. Discuss how clues helped in guessing.

Check and Connect:

Walk around to monitor accuracy of clues and use of correct place value terms.

Ask: **"How did that clue help?"**

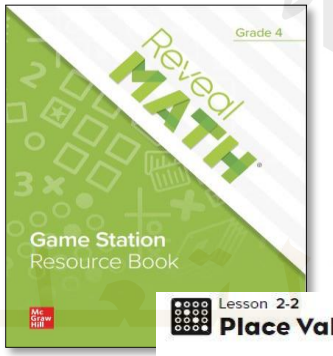
End with a brief **whole-class discussion** about how place value understanding helped them during the game.

Mastery

Correctly read and write any number up to 1,000,000 in standard, word, and expanded forms without errors.

Place Value Four in a Row (Game Station Activity)

Lesson Reference: Lesson 2-2
Pages: 4 to 8
Source: *Game Station Resource Book*





Lesson 2-2
Place Value Four in a Row

Players: 2 and an answer keeper

Materials: Number cube 1–6, 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. The player who rolls the least number goes first.

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

Beyond Mastery

Read and write numbers up to 1,000,000 in standard, word, and expanded forms accurately, enhancing fluency and number sense.

Millionaire Math Challenge

Activity Setup:

- Create a set of challenge cards/ stations around the classroom.
- Each card contains a clue or puzzle about a number up to one million.
- Clues must be solved and recorded in all 3 forms.

Instructions:

1. **Divide the class into small teams** (3–4 students).
2. Each team rotates through different challenge stations.
3. At each station, they solve a puzzle, e.g.: **"I have 6 digits. My thousands digit is 4, and the digit in the hundreds place is double that. Who am I?"** and record their answer in all 3 forms.
4. Teams check their answers before moving on and finish with a final challenge to unscramble a 6-digit number presented in different forms.

❖ **Finally, they must assemble the correct number and write it correctly in all three forms before the timer runs out.**

Domain
Number and Operations in Base Ten

Standards
4.NBT.A Generalize place value understanding for multi-digit whole numbers.
4.NBT.A.2 Read and write multi-digit numbers in different forms and compare them using place value and comparison symbols.

SMPs
MPs : **5** and **7**

Key Vocabulary
- expanded form
- period
- standard form
- word form
- *represent*

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2-2 Read and Write Numbers to One Million (cont'd)

Notes / Misconceptions:

- The last key vocab word (*represent*) in purple is an **academic term**–it's helpful to support students in understanding and using it correctly.
- Students might **leave out zeros** when writing numbers in **standard form**–keep an eye on this *common mistake*.

Resources:

Mastery Level Activity: *Game Station Resource Book* on Reveal platform.

Domain
Number and Operations in Base Ten

Standards
4.NBT.A and **4.NBT.A.2**

SMPs
MPs : **5** and **7**

Key Vocabulary
- expanded form
- period
- standard form
- word form
- *represent*

Basic Numeracy Skills

- Counting by 1s, 10s, 100s and 1000s.
- Addition and subtraction with large numbers,

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2-3 Compare Multi-Digit Numbers

Learning Objectives
Students should be able to:

- Compare multi-digit numbers using place value and record comparisons using symbols.

Number	Place Value	Digit Value
2632	ones	
7670		
4519		
8197		7
5564	hundreds	
9248		9000
5385		

Towards Mastery

How can you use number cubes to help students practice comparing 4-digit numbers?

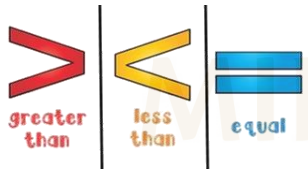
Which is Greater?

Preparation Steps:

- **Materials**: 4 number cubes per group, paper and pencils.
- **Grouping**: Divide students into small groups (3-4).

Instructions:

1. Number Generation: One student rolls 4 dice to make a **4-digit number** and others record it. The same student rolls again for a second number.
2. Comparison: Group compares the two numbers, starting with the **thousands place**.
3. Inequality Sentence: Write an inequality sentence **(e.g., 2514 < 3102)**.
4. Taking Turns: Have the next student roll; repeat as time allows.



Check and Connect:

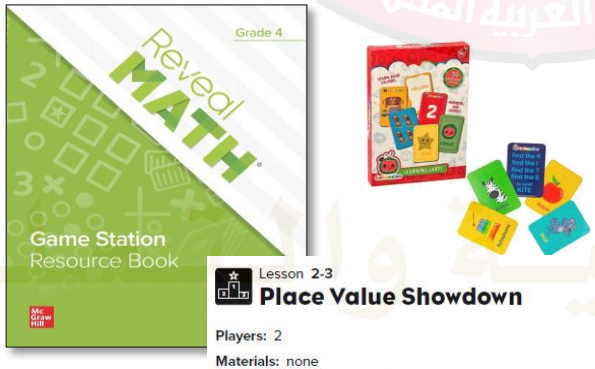
- Observe number comparisons and inequality sentences. Ask students to explain their reasoning.

Mastery

Compare multi-digit numbers based on place value and correctly use symbols to record the comparisons.

Place Value Showdown (Game Station Activity)

Lesson Reference: Lesson 2-3
Pages: 9 to 12
Source: *Game Station Resource Book*



Lesson 2-3
Place Value Showdown

Players: 2

Materials: none

Directions: Shuffle the cards and place in a stack. Each player picks 5 number cards. Make the greatest number possible with your 5 cards and write the number on the game board. Compare the numbers with a symbol >, <, or =. Whoever has the greatest number wins a point. Shuffle the cards again and repeat instructions. Whoever has the most points when the game board is complete wins the round.

Play the next round using 6 number cards.

Beyond Mastery

Students will accurately compare and order multi-digit numbers (up to 6 digits) using place value understanding and comparison symbols.

Number Detective Challenge

Instructions:

1. Prepare a set of mystery number cards (each card has a 5- or 6-digit number and a short clue about its value or position, e.g.: **"This number is greater than 452,000 but less than 600,000".**

2. Give students 5–7 mystery cards and ask them to:
- Use clues to **order the numbers** from least to greatest.
- **Justify** their order using place value reasoning in writing or orally.
- Use comparison symbols to write number sentences **(e.g., 523,450 > 498,320).**



Challenge Extension:

❖ Ask students to **create** their own set of mystery clues and number cards for classmates to solve.

Domain
Number and Operations in Base Ten

Standards
4.NBT.A Generalize place value understanding for multi-digit whole numbers.
4.NBT.A.2 Read and write multi-digit numbers in different forms and compare them using place value and comparison symbols.

SMPs
MPs : **2** and **5**

Key Vocabulary
- digit
- value
- *conjecture*

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2-3 Compare Multi-Digit Numbers (cont'd)

Notes / Misconceptions:

- The last key vocab word (*conjecture*) in purple is an **academic term**–it's helpful to support students in understanding and using it correctly.
- Students might compare numbers by looking *only at the larger first digit*, without considering the **total number of digits**.

Resources:

Mastery Level Activity: *Game Station Resource Book* on Reveal platform.

Domain
Number and Operations in Base Ten

Standards
4.NBT.A and **4.NBT.A.2**

SMPs
MPs : **2** and **5**

Key Vocabulary
- digit
- value
- *conjecture*

Basic Numeracy Skills

- Understanding place value.
- Using comparison symbols.

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2-4 Round Multi-Digit Numbers

Learning Objectives

Students should be able to:

- Determine an estimate by rounding numbers to an appropriate place.
- Round multi-digit numbers to any place.

Towards Mastery

How can place-value charts and number lines help students round whole numbers?

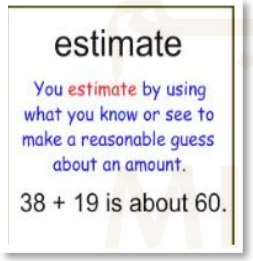
How Many Ways?

Preparation Steps:

- **Materials**: Place-value charts or number lines / whiteboard / markers or pens.

Instructions:

1. Introduce/Display a Number: **e.g., 526,875**
2. Rounding:
   - Identify the **relevant digit**.
   - Determine the two numbers **it's between**.
   - Use the place-value chart/number line.
   - Explain reasoning and round.
3. Repeat: Round to other place values (**ten thousand, thousand, hundred**).



Check and Connect:

- Observe use of charts/lines and check explanations.

Mastery

Correctly round multi-digit numbers to any place and use the estimates to make and justify reasonable solutions.

Rounding Numbers Race (Game Station Activity)

Lesson Reference: Lesson 2-4
Pages: 13 to 16
Source: *Game Station Resource Book*



Beyond Mastery

Students will round multi-digit numbers (up to 6 digits) to the nearest ten, hundred, thousand, ten thousand, and hundred thousand with accuracy and explain their reasoning.

Rounding Treasure Hunt

Instructions:

1. Prepare a "map" or a worksheet with different stations (each station gives a multi-digit number and asks students to round it to a specific place value).

2. **At each station:**
   - Students solve the rounding problem (e.g., round 482,739 to the nearest thousand).
   - After rounding, they are given a *clue* that leads them to the next station (e.g., "If your answer is greater than 480,000, move to station 5!").

3. **Final Challenge:** At the last station, students must create a **real-world rounding problem** (e.g., estimating Expo visitors) and solve it.

Challenge Extension:

- Some stations include numbers that need **multiple rounds (e.g., first round to the nearest thousand then round the result to the nearest ten thousand).**

Domain
Number and Operations in Base Ten

Standards
4.NBT.A Generalize place value understanding for multi-digit numbers.
4.NBT.A.3 Use place value understanding to round multi-digit whole numbers to any place.

SMPs
MPs : **5** and **6**

Key Vocabulary
- halfway point
- round
- *estimate*
- *justify*

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2-4 Round Multi-Digit Numbers (cont'd)

Notes / Misconceptions:

- The last 2 key vocab words (*estimate* and *justify*) in purple are **academic terms**–it's helpful to support students in understanding and using them correctly.
- Students may incorrectly decrease a digit during rounding when the **following digit is less than 5**, instead of leaving it **unchanged**.

Resources:

Mastery Level Activity: *Game Station Resource Book* on Reveal platform.

Domain
Number and Operations in Base Ten

Standards
4.NBT.A and **4.NBT.A.3**

SMPs
MPs : **5** and **6**

Key Vocabulary
- halfway point
- round
- *estimate*
- *justify*

Basic Numeracy Skills

- Identifying the rounding digit and checking the next digit.

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Addition and Subtraction Strategies and Algorithms

Notes & Guidance

Unit 3
In this unit, students will focus on estimating sums using strategies like rounding, front-end estimation, and compatible numbers. They will build on their understanding of when and why estimation is useful.
They will also expand on their prior knowledge of adding and subtracting up to 3-digit numbers by applying those strategies to numbers with up to 6 digits.
By the end of the unit, students will be confident in using vertical or standard algorithms to perform addition and subtraction.

Key Skills & Learning Goals

- ✓ **Estimate sums and differences:** Using strategies like rounding, front-end estimation, and compatible numbers.
- ✓ **Add and subtract multi-digit numbers:** Accurately solve problems involving up to 6-digit numbers using standard (vertical) algorithms.
- ✓ **Analyze place value understanding:** Recognize the role of each digit based on its position, especially when estimating or regrouping.
- ✓ **Communicate mathematical thinking:** Explain strategies and justify methods used in solving addition and subtraction problems.

Pedagogy

- **Explicit Instruction:** Clearly model estimation strategies and standard algorithms step-by-step, especially for rounding and front-end estimation.
- **Problem-Based Learning (PBL):** Present real-world word problems that require estimation and multi-digit addition/subtraction to make learning relevant and meaningful.
- **Collaborative Learning:** Use partner or group tasks to promote discussion, peer teaching, and multiple problem-solving strategies.
- **Formative Assessment and Feedback**: Use quick checks or exit tickets to gauge understanding and guide instruction.

International Assessment Links

IEA TIMSS **Whole Numbers** Add and subtract whole numbers up to 6 digits using strategies and standard algorithms and solve related word problems.

PISA **Arithmetic Operations** The nature and properties of these operations and related notational conventions.

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Unit 3 - Addition and Subtraction Strategies and Algorithms
Learning Objectives & Criteria

Unit Goal:
Add and subtract multi-digit numbers using estimation strategies and standard algorithms, building on prior knowledge with methods like partial sums, adjusting, and decomposition.

Learning Objective (LO)	Common Core State Standard	Formative Assessment Criteria
Estimate sums and differences involving multi-digit numbers.	4.OA.A.3 Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. 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. 4.NBT.B.4 Fluently add and subtract multi-digit whole numbers using the standard algorithm.	Estimate multi-digit sums or differences correctly and explain their strategy. Example: Round 3,745 + 2,186 and explain why.
Use estimates to determine if a sum or difference is reasonable.		Use estimation to check if a calculated sum or difference is reasonable.
Add multi-digit numbers by adjusting numbers or decomposing numbers based on place value.		Add multi-digit numbers by breaking them apart using place value and explains the process.
Use and explain a standard addition algorithm without regrouping.		Correctly use the standard addition algorithm without regrouping and explain each step.
Use and explain a standard addition algorithm with regrouping.		Accurately use the standard addition algorithm with regrouping and explain the steps involved.
Subtract multi-digit numbers by adjusting or decomposing numbers based on place value.		Subtract multi-digit numbers by decomposing based on place value. Example: Solve 642 – 358 by breaking apart.
Use and explain a standard subtraction algorithm without regrouping.		Correctly use the standard subtraction algorithm without regrouping and explain each step.
Use and explain a standard subtraction algorithm with regrouping.		Accurately use the standard subtraction algorithm with regrouping and explain the regrouping steps (borrowing).
Solve multi-step problems with whole numbers by using representations such as bar diagrams and equations.		Solve multi-step word problems using visual models (like bar diagrams) and equations to show their thinking.
Solve multi-step problems involving addition and subtraction.		Correctly apply a logical sequence of steps to solve the problem, showing clear work for each operation.

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3-1 Estimate Sums or Differences

Learning Objectives

Students should be able to:

- Estimate sums and differences involving multi-digit numbers.
- Use estimates to determine if a sum or difference is reasonable.

Towards Mastery

How does a coin toss game help students practice estimating sums and differences of 2-digit numbers?

Estimating Sums and Differences

Preparation Steps:

- **Materials**: Coins / paper / pencils.
- **Grouping:** Pairs

Instructions:

1. Number Generation: Each student writes **two 2-digit numbers.**
2. Operation Selection: Pairs flip a coin (**Heads: Sum; Tails: Difference**).
3. Estimation: Students estimate using:
- Rounding: Round to the nearest ten, then add/subtract.
- Front-end: Add/subtract **tens digits**.

Then, write estimates.

4. Discussion: **Compare estimates**; calculate actual sum/difference; discuss accuracy, and repeat.



Check and Connect:

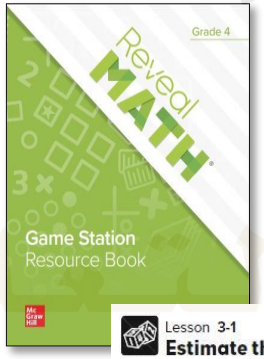
- Observe estimations, ensure correct rounding/front-end use, check accuracy discussion.

Mastery

Accurately estimate sums and differences of multi-digit numbers and explain whether the estimate is reasonable for the given context.

Estimate the Sum or Difference Bump (Game Station Activity)

Lesson Reference: Lesson 3-1
Pages: 17 to 20
Source: *Game Station Resource Book*





Lesson 3-1
Estimate the Sum or Difference Bump

Players: 2 or more and an answer keeper

Materials: Number cube 1–6, small game pieces like counters

Directions: Each player chooses a different color of counters and takes 10 of that color. Roll a number cube. The player who rolls the least number goes first.

When it is your turn, pick a card. Estimate the sum or difference on your card to the nearest 500; 1,000; 1,500; 2,000; 2,500; or 3,000. The answer keeper checks your answer with the answer key. If you are correct, place one of your counters on the correct estimate on the board. If you are incorrect, you lose your turn.

Beyond Mastery

Students will round multi-digit numbers (up to 6 digits) with accuracy and explain their reasoning.

Estimation Showdown

Instructions:

1. Prepare a set of challenging word problems **(e.g., An event center sold 48,729 tickets in July and 37,486 tickets in August. About how many tickets were sold in total? Give an estimate).**

2. In pairs or small groups:
- Students estimate the sum or difference **using two different strategies**: rounding and front-end estimation.
- They **compare** the two estimates and decide which is more reasonable for the situation.
- Each group must **explain their thinking** in a few sentences.





Challenge Extension:

❖ Students create their own **real-world estimation problem** related to *travel, shopping*, or *sports scores* and exchange problems with another group to solve.

Domain
Operations and Algebraic Thinking

Standards
4.OA.A.3 Solve real-world problems using all operations and whole numbers. Use letters for unknowns, make sense of remainders, and check answers using estimation.

SMPs
MPs : **1** and **2**

Key Vocabulary
- estimate
- front-end estimation
- round
- *reasonable*

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3-1 Estimate Sums or Differences (cont'd)

Notes / Misconceptions:

- The last key vocab word (*reasonable*) in purple is an **academic term**–it's helpful to support students in understanding and using it correctly.
- Students may incorrectly round the entire number to the *greatest place value instead* of using **only the leading digit for front-end estimation**. Remind them that in front-end estimation, they should **focus on the first digit** to make their estimate.

Resources:

Mastery Level Activity: *Game Station Resource Book* on Reveal platform.

Domain
Operations and Algebraic Thinking

Standards
4.OA.A.3

SMPs
MPs : **1** and **2**

Key Vocabulary
- estimate
- front-end estimation
- round
- *reasonable*

Basic Numeracy Skills

- Determining the correct operation.

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3-2 Strategies to Add Multi-Digit Numbers

Learning Objectives

Students should be able to:

- Add multi-digit numbers by adjusting numbers or decomposing numbers based on place value.

Towards Mastery

Students will add multi-digit numbers by using place value and carrying when needed.

Adding Up Big Sums!

Preparation Steps:

- Gather number cubes (dice) – at least 2 per pair of students and paper or whiteboards for recording sums.

Instructions:

1. Pair up the students. Each student rolls the number cubes:
- First Roll: Create a **4-digit addend**; Second roll: create a **3-digit addend**.
2. Assign roles:
- **Student A** uses **partial sums** to add the numbers.
- **Student B adjusts numbers** to add (rounding or easing easier numbers).
3. After calculating, **students compare their results,** discuss any differences in their results & work together to resolve any discrepancies. Then, switch roles.



Check and Connect:

Ask guiding questions: **"How did you break apart the numbers for partial sums?"**

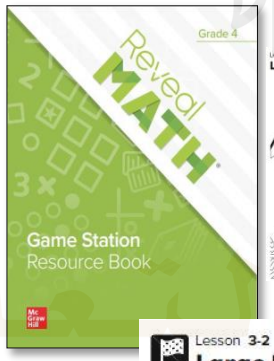
"What adjustments did you make to simplify the addition?"

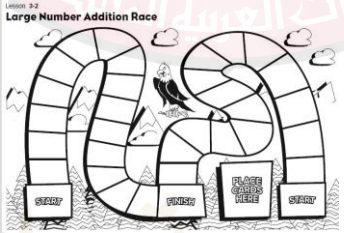
Mastery

Accurately add multi-digit numbers by decomposing or adjusting them based on place value and explain the strategy.

Large Number Addition Race (Game Station Activity)

Lesson Reference: Lesson 3-2
Pages: 21 to 24
Source: *Game Station Resource Book*





Lesson 3-2
Large Number Addition Race

Players: 2 and an answer keeper

Materials: Small game pieces like counters

Directions: Play the game Rock-Paper-Scissors to decide who will go first. Player 1 starts on the right Start space and Player 2 starts on the left Start space.

When it is your turn, pick a card. Use addition strategies to solve the problem on your card. The answer keeper checks your answer with the answer key. If you are correct, move your game piece the number of spaces shown on the card. If not, stay on your space. Now it is the next player's turn. The player who reaches the Finish line first wins the game.

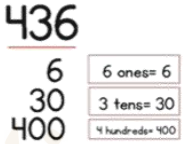
Beyond Mastery

Apply different strategies (partial sums, adjusting numbers, and standard algorithm) to accurately add multi-digit numbers and explain their reasoning.

Addition Strategy Challenge

Instructions:

1. Provide students with a set of complex multi-digit addition problems **(e.g., 5-digit + 4-digit).**
2. For each problem:
- Solve it using **two different strategies** (e.g., partial sums and adjusting numbers).
- Show all steps clearly for each method.
- Compare the results
- Explain which method was faster, easier, or made more sense to them.



436= 6 ones, 3 tens, and 4 hundreds

Challenge Extension:

❖ Create their **own multi-digit addition problem** where using partial sums is easier than using the standard algorithm and explain why.

Example Problem: 4,378 + 3,647

Solve using:

- Partial sums method.
- Adjusting numbers **(e.g., round 3,647 to 3,650, then adjust after adding).**

Domain
Number and Operations in Base Ten

Standards
4.NBT.B Use place value understanding and properties of operations to perform multi-digit arithmetic.
4.NBT.B.4 Fluently add and subtract multi-digit whole numbers using the standard algorithm.

SMPs
MP: **7**

Key Vocabulary
- decompose
- partial sums

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3-2 Strategies to Add Multi-Digit Numbers (cont'd)

Notes / Misconceptions:

❖ When **adjusting numbers** to make addition easier, students might forget to **adjust back at the end**.

❖ Students may incorrectly carry over digits when the **sum of a column is more than 9**.

Resources:

Mastery Level Activity: *Game Station Resource Book* on Reveal platform.

Domain
Number and Operations in Base Ten

Standards
4.NBT.B and **4.NBT.B.4**

SMPs
MP: **7**

Key Vocabulary
- decompose
- partial sums

Basic Numeracy Skills

- Breaking apart numbers (decomposing).
- Use efficient mental math strategies.

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3-3 Understand an Addition Algorithm

Learning Objectives

Students should be able to:

- Use and explain a standard addition algorithm without regrouping.

Towards Mastery

Students will learn how to add multi-digit numbers step by step using place value.

Flip It, Add It!

Preparation Steps:

- In Pairs: prepare 4 index cards for each student. On each card, students write a different digit **between 0-4**

Instructions:

1. Pair students together. Each student flips over 3 index cards to create a **3-digit number.**
   - First student: creates the **first addend**; Second student: creates the **second addend**.
2. Students add both numbers **using 2 different methods:**
   - Partial sums method and traditional standard algorithm.
3. After solving both ways, students **compare their answers** and discuss: **"How are the 2 strategies similar and how are they different?"**
4. Repeat the process with new numbers.



Check and Connect:

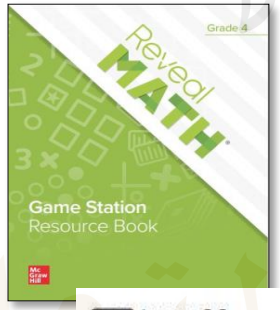
- Ensure students correctly form 3-digit numbers and use both addition strategies.
- Ask guiding questions: **"Which method is easier for you? Why?"** and **"Did both methods give you the same final sum?"**

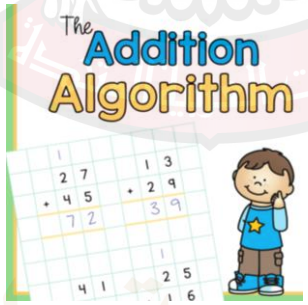
Mastery

Solve addition problems without regrouping using the standard algorithm and clearly explain each step of the process.

Addition Algorithm Showdown (Game Station Activity)

Lesson Reference: Lesson 3-3
Pages: 25 to 28
Source: *Game Station Resource Book*





Lesson 3-3
Addition Algorithm Showdown

Players: 2 or more and an answer keeper

Materials: none

Directions: Shuffle the cards and stack them in a pile. Each player picks a card. Find the sum and record it on your card. The answer keeper checks your answers using the answer key. Whoever has the greatest sum keeps both cards. The game ends when all the cards are gone. Whoever has the most cards wins.

Beyond Mastery

I can use an addition strategy to add large numbers and explain steps in a way others can understand.

Build Your UAE City!

Instructions:

1. Tell students: *You are city planners helping to expand famous UAE cities like Abu Dhabi, Dubai, or Sharjah! You need to add up the populations of neighborhoods to see how big your city will become.*
2. Provide each student or pair with "city data cards" – each card has the name of a neighborhood (like Deira, Al Majaz, …) and a **4-digit or 5-digit population number.**
3. Students **choose two or more neighborhoods** to "combine" and **use the standard addition algorithm** to add their populations.
4. After solving, students must explain their steps in words **(e.g., why they regrouped).** And **draw a mini city map** labeling the new combined neighborhoods.

Challenge Extension:

- ❖ Students can "build" their own city by adding more neighborhoods and keep track of the total population as they add.

Example:
Al Ain (Population 18,423) + Al Bateen (Population 9,827)

Domain
Number and Operations in Base Ten

Standards
4.NBT.B Use place value understanding and properties of operations to perform multi-digit arithmetic.
4.NBT.B.4 Fluently add and subtract multi-digit whole numbers using the standard algorithm.

SMPs
MPs : **2** and **7**

Key Vocabulary
- algorithm
- *efficiently*

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3-3 Understand an Addition Algorithm (cont'd)

Notes / Misconceptions:

- Students often make the mistake of not aligning numbers by **place value in addition**. Remind them that the algorithm adds digits in the **same place value column**, so alignment is crucial for accuracy.
- The last key vocab word (*efficiently*) in purple is an **academic term**—it's helpful to support students in understanding and using it correctly.

Resources:

Mastery Level Activity: *Game Station Resource Book* on Reveal platform.

Domain
Number and Operations in Base Ten

Standards
4.NBT.B and **4.NBT.B.4**

SMPs
MPs : **2** and **7**

Key Vocabulary
- algorithm
- *efficiently*

Basic Numeracy Skills

- Regrouping accurately.
- Applying each step of the addition algorithm in the correct order.

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3-4 Understand an Addition Algorithm Involving Regrouping

Learning Objectives

Students should be able to:

- Use and explain a standard addition algorithm with regrouping.

Towards Mastery

Students will learn how to add multi-digit numbers by regrouping.

Spin to Add!



Preparation Steps:

- Prepare spinners labeled with digits 0-9. Provide each pair of students with a spinner and recording sheets.
- Have notebooks ready for solving addition problems.

Instructions:

1. First student spins the spinner **3 times**, recording each digit to form a **3-digit number**.
2. The same student spins three more times to create a **second 3-digit number.**
3. Both students **add the two 3-digit numbers.**
4. Students **check each other's work**, focusing especially on correct regrouping when necessary.
5. Switch roles and repeat, allowing both students to create new numbers and solve.



Check and Connect:

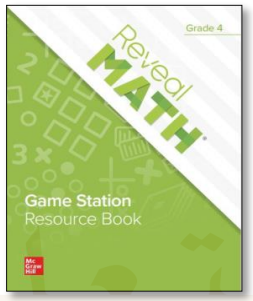
- Ensure students are **lining up digits by place-value** before adding.
- Ask reflective questions: **"How do you know your sum is correct?"**

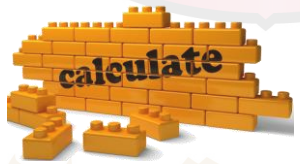
Mastery

Correctly use the standard addition algorithm with regrouping and clearly explain how and why regrouping is used at each step.

Estimate and Calculate Sums Task Cards (Game Station Activity)

Lesson Reference: Lesson 3-4
Pages: 29 to 31
Source: *Game Station Resource Book*





Lesson 3-4
Estimate and Calculate Sums Task Cards

Players: 1
Materials: none
Directions: Pick a card. Calculate an estimated sum. Then calculate the actual sum. Check the actual sums with the answer key.

Beyond Mastery

I can add big numbers with regrouping and explain my steps – just like planning a race across the UAE!

Desert Rally Addition Challenge

Instructions:

1. Tell students: *"You are drivers in a desert rally race across the UAE! You must add up the distances you travel between famous UAE cities to find your total journey!"*
2. Provide a list of **UAE cities & distances between them**:
   - **Dubai to Abu Dhabi: 140 km**
   - **Fujairah to Ras Al Khaima: 100 km**
3. Students **choose 2–3 routes** and **add the distances** using the **standard addition algorithm**.
4. Students must **show their addition clearly** step-by-step, **highlight where regrouping happens** and explain why it was necessary.

Bonus Challenge:

- Students search and design their own "desert rally" by making up new distances between other UAE cities.

Check and Connect:

- Look for accurate regrouping, especially when sums in the tens or hundreds place **exceed 9**.
- Ask: **"How would your journey change if you traveled a different path?"**

Domain
Number and Operations in Base Ten

Standards
4.NBT.B Use place value understanding and properties of operations to perform multi-digit arithmetic.
4.NBT.B.4 Fluently add and subtract multi-digit whole numbers using the standard algorithm.

SMPs
MPs : **3** and **8**

Key Vocabulary
- regroup
- *indicate*
- *logical*

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3-4 Understand an Addition Algorithm Involving Regrouping (cont'd)

Notes / Misconceptions:

- Students may not accurately **line up the digits by place value**.
- The last 2 key vocab words (*indicate* and *logical*) in purple are **academic terms**—it's helpful to support students in understanding and using them correctly.

Resources:

Mastery Level Activity: *Game Station Resource Book* on Reveal platform.

Domain
Number and Operations in Base Ten

Standards
4.NBT.B and **4.NBT.B.4**

SMPs
MPs : **3** and **8**

Key Vocabulary
- regroup
- *indicate*
- *logical*

Basic Numeracy Skills

- Basic addition facts (single-digit numbers).
- Understanding the concept of regrouping.

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3-5 Strategies to Subtract Multi-Digit Numbers

Learning Objectives

Students should be able to:

- Subtract multi-digit numbers by adjusting or decomposing numbers based on place value.

Towards Mastery

How can number cubes help students practice subtraction and compare strategies?

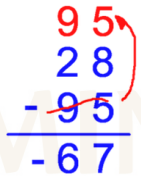
What's the Difference?

Preparation Steps:

- **Materials**: Number cubes / paper / pencils.
- **Grouping:** Pairs
- **Review:** Subtraction strategies (algorithm, breaking apart, etc.).

Instructions:

1. Number Generation: Each student rolls dice for **two 4-digit numbers.**
2. Subtraction Problem: Students create a subtraction problem (**larger minus smaller**).
3. Partners solve the *same problem* using **different strategies.**
4. Comparison: Students **compare** answers and **discuss** their strategies; repeat as time allows.



Check and Connect:

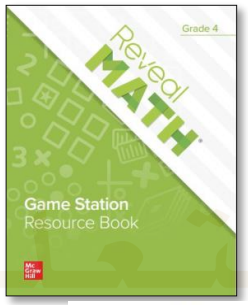
- Observe problem setup, strategy use, and discussions.
- Develop strategic thinking and mathematical communication.

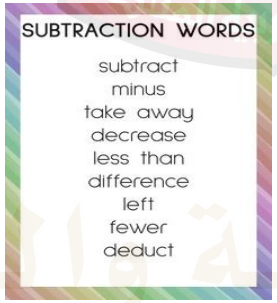
Mastery

Accurately subtract multi-digit numbers by breaking them apart or adjusting based on place value and explain their method clearly.

Large Number Subtraction Race (Game Station Activity)

Lesson Reference: Lesson 3-5
Pages: 32 to 35
Source: *Game Station Resource Book*





Lesson 3-5
Large Number Subtraction Race

Players: 2 or more and an answer keeper
Materials: Small game pieces like counters
Directions: Play the game Rock-Paper-Scissors to decide who will go first.

When it is your turn, pick a card. Use subtraction strategies to solve the problem on your card. The answer keeper checks your answer with the answer key. If you are correct, move your game piece the number of spaces shown on the card. If not, stay on your space. Now it is the next player's turn. The player who reaches the Finish line first wins the game.

Beyond Mastery

I can solve real-life subtraction problems, like shopping in a UAE market, by using different strategies.

Market Day in the UAE

Story Setup:

Students imagine they are visiting a *traditional Emirati market* (**souk**) like Souk Madinat Jumeirah or the Gold Souk in Dubai. They are given a budget (**e.g., 5,000 AED**) to shop for items such as **dates, abayas, kanduras, and gold jewelry.**

Each item has a realistic price tag (multi-digit numbers, **e.g., 1,485 AED for a gold ring, 2,375 AED for a carpet**).



Challenge:

Students must **"buy" multiple items**, subtracting each amount from their total budget.

They must **show two different subtraction strategies** for each transaction.

If they **overspend**, they must explain how much **over the budget** they went (again using subtraction).

Students must end with **a final "receipt"** showing all subtractions and **remaining money**.

Bonus Twist:

- If they finish early, they can calculate ***how much more money*** they would need to buy a **special item** (like a pearl necklace worth 6,250 AED).

Domain
Number and Operations in Base Ten

Standards
4.NBT.B Use place value understanding and properties of operations to perform multi-digit arithmetic.
4.NBT.B.4 Fluently add and subtract multi-digit whole numbers using the standard algorithm.

SMPs
MPs : **2** and **3**

Key Vocabulary
- decompose
- difference
- *prove*
- *valid*

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3-5 Strategies to Subtract Multi-Digit Numbers (cont'd)

Notes / Misconceptions:

- Students may see the phrase "***how many more***" and think it means they should add.
- The last 2 key vocab words (*prove* and *valid*) in purple are **academic terms**—it's helpful to support students in understanding and using them correctly.

Resources:

Mastery Level Activity: *Game Station Resource Book* on Reveal platform.

Domain
Number and Operations in Base Ten

Standards
4.NBT.B and **4.NBT.B.4**

SMPs
MPs : **2** and **3**

Key Vocabulary
- decompose
- difference
- *prove*
- *valid*

Basic Numeracy Skills

- Subtraction within 1,000
- Understanding zeros in subtraction.

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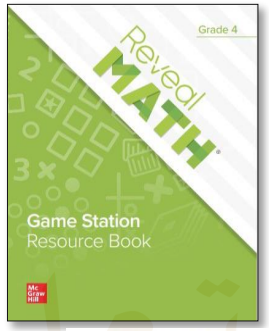
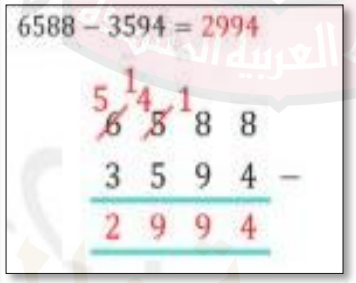
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3-6 Understand a Subtraction Algorithm

Learning Objectives

Students should be able to:

- Use and explain a standard subtraction algorithm without regrouping.

Towards Mastery	Mastery	Beyond Mastery
How can students practice the subtraction algorithm and check answers with estimation?	*Correctly solve subtraction problems without regrouping using the standard algorithm and clearly explain each step.*	*I can understand and use a subtraction algorithm to solve real-world problems correctly.*
Subtraction Algorithm Challenge	**Subtraction Algorithm Showdown (Game Station Activity)**	**Desert Adventure: Subtract to Survive!**
Preparation: • **Materials**: Paper / pencils. • **Grouping:** Pairs **Instructions:** 1. Number Generation: Students write **two 2-digit numbers** (*larger digits on top*) and align them. Then, swap papers. 2. Subtraction: Students subtract using the **algorithm.** 3. Estimation: *Before checking*, students **estimate by rounding to the nearest ten.** 4. Students **compare** their answer to the estimate. 5. Discuss: Partners discuss the **estimate's accuracy**.  **Check and Connect:** ➢ Observe number generation, algorithm use, and estimation. ➢ Reinforce subtraction algorithm, estimation skills, and number sense.	**Lesson Reference:** Lesson 3-6 **Pages:** 36 to 39 **Source:** *Game Station Resource Book*   Lesson 3-6 **Subtraction Algorithm Showdown** **Players:** 2 and an answer keeper **Materials:** none **Directions:** Shuffle the cards. Put them in a pile. Each player picks a card. Find the difference and record it on your card. The answer keeper checks your answers using the answer key. Whoever has the greatest difference keeps both cards. The game ends when all the cards are gone. Whoever has the most cards wins.	**Story Setup:** Students imagine they are explorers on a desert adventure visiting famous places like **Liwa Desert** and **Al Khatim Desert**. They have a **supply truck** carrying items like **water bottles, dates, and tents** — each with **starting quantities.** As they travel from one desert camp to another, they **use subtraction algorithms** to track supplies. **How It Works:** 1) Each student or team starts with a "supply list" **(e.g., 1,275 liters of water, 845 packs of dates, etc.).** 2) After each stop (*simulated by task cards*), they are given a scenario **(e.g., "You used 348 liters of water traveling to the next camp. How much water remains?")** 3) Students must **solve using a subtraction algorithm** and **show all their work** neatly. Then, explain their steps briefly.  **Bonus Challenge:** ❖ Some special cards will ask them to **choose a different subtraction strategy** (like *compensation* or *breaking apart numbers*) and explain why it might be faster or easier for that situation.

Domain
Number and Operations in Base Ten

Standards
4.NBT.B Use place value understanding and properties of operations to perform multi-digit arithmetic.
4.NBT.B.4 Fluently add and subtract multi-digit whole numbers using the standard algorithm.

SMPs
MPs : **2** and **7**

Key Vocabulary
- algorithm
- difference
- *check*

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3-6 Understand a Subtraction Algorithm (cont'd)

Notes / Misconceptions:

- When choosing *a subtraction algorithm*, students may forget to **begin their subtraction from the ones place**.
- The last key vocab word (*check*) in purple is an **academic term**—it's helpful to support students in understanding and using it correctly.

Resources:

Mastery Level Activity: *Game Station Resource Book* on Reveal platform.

Domain
Number and Operations in Base Ten

Standards
4.NBT.B and **4.NBT.B.4**

SMPs
MPs : **2** and **7**

Key Vocabulary
- algorithm
- difference
- *check*

Basic Numeracy Skills

- Subtraction within 1,000
- Subtracting with zeros.

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3-7 Understand a Subtraction Algorithm Involving Regrouping

Learning Objectives

Students should be able to:

- Use and explain a standard subtraction algorithm with regrouping.

Towards Mastery

Students will solve subtraction problems with regrouping using place value strategies & subtraction algorithm.

Flip It, Subtract It!

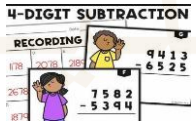
Preparation:

- In Pairs: Prepare slips of paper for each pair of students and make sure they have pencils and a workspace to record their numbers and calculations.

Instructions:

1. Pair students. One student writes several **4-digit numbers with a 4** in the *thousands place* on their slips **(example: 4,582; 4,197).**
2. The other student writes several **4-digit numbers with a 3** in the *thousands place* **(example: 3,746; 3,820).**
3. Students **pick one number** from each list and **subtract.**
4. Students **show their work step-by-step**, making sure they regroup (*borrow*) when needed.
5. Then, students check each other's work for accuracy.

Repeat the process until all slips have been used.



Check and Connect:

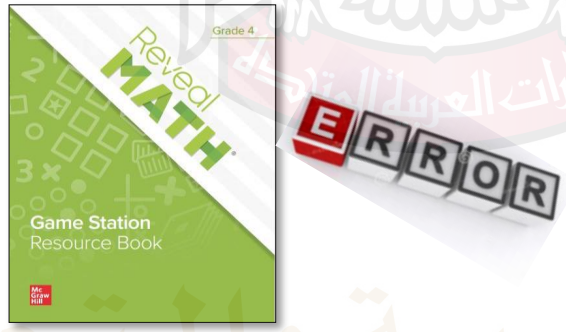
- ➢ Check if students are **lining up digits correctly by place value.**
- ➢ Ensure that students are **regrouping properly** when the top digit is smaller than the bottom digit in a column.
- ➢ Ask reflective questions: **"Where did you need to regroup?"** and **"How did you know which number to subtract from the other?"**

Mastery

Accurately use the standard subtraction algorithm with regrouping and clearly explain when and why regrouping is needed.

Subtract with Regrouping Task Cards (Game Station Activity)

Lesson Reference: Lesson 3-7
Pages: 40 to 43
Source: *Game Station Resource Book*



Lesson 3-7
Subtract with Regrouping Task Cards

Players: 2

Materials: none

Directions: Turn and talk with a partner about the errors the student made when solving the problem on the task card. Explain your thinking and show how you would fix the errors. Then, solve the problem correctly.

Beyond Mastery

I can subtract large numbers with regrouping and explain my steps, like planning my day at Expo Dubai!

Expo Adventure Budget

Instructions:

1. Tell students: *"You are spending a full day exploring Expo Dubai! You have a set budget and must subtract the cost of visiting pavilions, trying foods, and buying souvenirs without running out of money!"*
2. Provide a price list of Expo-related activities, for example:
   - **Traditional UAE meal at a food court: 75 AED**
   - **Expo souvenir T-shirt: 300 AED**
   - **Virtual reality experience: 359 AED**
   - **Expo souvenir keychain: 62 AED**
   - **Pavillon VIP Ticket: 640 AED**
3. Give students a **starting budget** (**e.g., 1,200 AED**).
4. Students "spend" their money by choosing activities and **subtracting** each cost step-by-step using the **standard subtraction algorithm** with *regrouping*.
5. They must **explain their regrouping** decisions and **keep track of remaining money** after each subtraction.

Bonus Challenge:



- ❖ Try to **spend as close to the full amount as possible** without going over the budget!

Domain
Number and Operations in Base Ten

Standards
4.NBT.B Use place value understanding and properties of operations to perform multi-digit arithmetic.
4.NBT.B.4 Fluently add and subtract multi-digit whole numbers using the standard algorithm.

SMPs
MP: **8**

Key Vocabulary
- regroup
- *clarify*

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3-7 Understand a Subtraction Algorithm Involving Regrouping (cont'd)

Notes / Misconceptions:

- Students may begin subtracting from the *largest place value* (left to right), instead of starting with the **ones place.**
- When regrouping across one or more zeros (e.g., in $4,003 - 1,678$), students might get confused about where to "*borrow*" from.
- The last key vocab word (*clarify*) in purple is an **academic term**–it's helpful to support students in understanding and using it correctly.

Resources:

Mastery Level Activity: *Game Station Resource Book* on Reveal platform.

Domain
Number and Operations in Base Ten

Standards
4.NBT.B and **4.NBT.B.4**

SMPs
MP: **8**

Key Vocabulary
- regroup
- *clarify*

Basic Numeracy Skills

- Subtracting with zeros.
- Borrowing from next place value.

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3-8 Represent and Solve Multi-Step Problems

Learning Objectives

Students should be able to:

- Solve multi-step problems with whole numbers by using representations such as bar diagrams and equations.

Towards Mastery

Solve multi-step word problems using addition and subtraction.

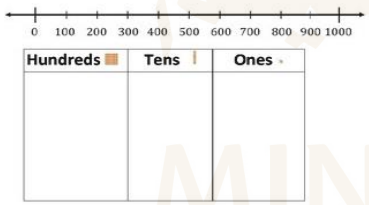
Find the Solution

Preparation Steps:

- Prepare a set of multi-step word problems related to travel, shopping or an event like UAE National Day.
- Divide students into pairs/groups.

Instructions:

1. **Distribute word problems** to each group.
2. Ask students to **read the problem together** and **discuss** what it is asking.
3. Have students **create a model** (like a *number line* or *place value chart*). And encourage them to **agree on and write an equation** before solving.
4. Students **solve step-by-step**, showing their work.
5. **Repeat** with another problem or switch groups to solve each other's problems.



Check and Connect:

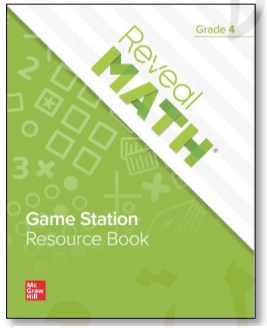
- Ask: **"Does your answer make sense in the context of the problem?"**
- Encourage peer feedback: **"What would you do differently?"**

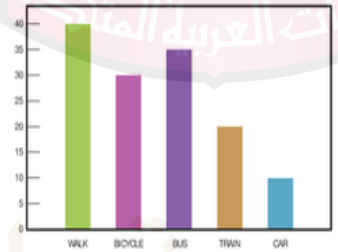
Mastery

Correctly solve multi-step whole number problems using bar diagrams or equations and clearly explain their reasoning.

Problem Solving with Bar Diagrams Task Cards (Game Station Activity)

Lesson Reference: Lesson 3-8
Pages: 44 to 48
Source: *Game Station Resource Book*





Lesson 3-8
Problem Solving with Bar Diagrams Task Cards

Players: 1
Materials: None
Directions: Pick a task. Use bar diagrams and equations to complete each problem. Then check your answers with the answer key.

Beyond Mastery

Solve tricky real-life math problems with more than 1 step by using strategies and models to explain my thinking.

Plan a UAE National Day Celebration!

Instructions:

1. Present students with a real-life scenario
"Your school is preparing for UAE National Day. You're in charge of decorations and snacks. You bought **3 packs of UAE flags for AED25 each** and **5 trays of dates for AED18 each**. You have **a budget of AED200**. How much money will be left? If you also plan to buy **4 T-shirts for volunteers at AED20 each**, will you have **enough money**? How **much over or under budget** will you be?"

2. Have students:
- Highlight the **key information**.
- **Draw** a bar model or number line to represent each step.
- Write the **number sentences** and solve each part.
- **Explain** their thinking using words and visuals.
- Share their solution with another group and **discuss different strategies used.**





Check and Connect:

- Check for correct operations & logic in the steps.
- Ask guiding questions like: **"What's the first step?"** and **"How do you know you should add/subtract here?"**

Domain
Operations and Algebraic Thinking

Standards
4.OA.A.3 Solve multi-step word problems with whole numbers using all operations. Represent unknowns with letters, interpret remainders, and check answers using mental math and estimation.

SMPs
MPs : **1** and **2**

Key Vocabulary
- variable

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3-8 Represent and Solve Multi-Step Problems (cont'd)

Notes / Misconceptions:

- Students might use the **wrong operation** (e.g., *adding instead of subtracting*) due to misunderstanding keywords or context.
- Student may complete **only the first step** of a multi-step problem and assume they're done.

Resources:

Mastery Level Activity: *Game Station Resource Book* on Reveal platform.

Domain
Operations and Algebraic Thinking

Standards
4.OA.A.3

SMPs
MPs : **1** and **2**

Key Vocabulary
- variable

Basic Numeracy Skills

- Understand and apply the operations correctly.
- Place-value knowledge.

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3-9 Solve Multi-Step Problems Involving Addition and Subtraction

Learning Objectives

Students should be able to:

- Solve multi-step problems involving addition and subtraction.

Towards Mastery

I can work with others to solve multi-step word problems and explain how I got my answer.

Multi-Steps to Find the Solution

Preparation Steps:

- Prepare 3-4 multi-step word problems.
- Group students in **pairs** or **triads**.

Instructions:

1. **Underline** important information and **circle** what the question is asking.
2. Discuss and agree on a strategy to solve the problem. Decide **which operations to use** and in **what order**.
3. **Model** your thinking using a number sentence, equation, or drawing.
4. **Solve** the problem step-by-step, showing all your work and **explain** your reasoning to your partner(s) as you go.



Sample Problem:

During a trip to a camel farm in Ras Al Khaimah:

- A group of students saw **85 camels** in the first enclosure and **73 camels** in the second.
- Then, **29 camels were moved** from the second enclosure to a third enclosure.

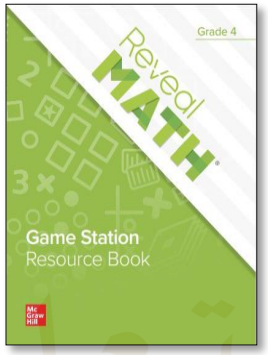
How many camels were left in the first and second enclosures combined?

Mastery

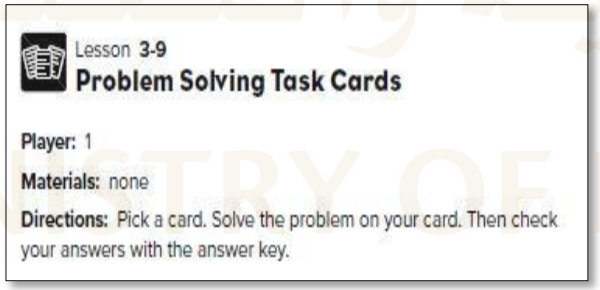
Accurately solve multi-step problems using addition and subtraction and explain the steps taken to reach the solution.

Problem Solving Task Cards (Game Station Activity)

Lesson Reference: Lesson 3-9
Pages: 49 to 51
Source: *Game Station Resource Book*







Beyond Mastery

I can solve real-life math problems using addition and subtraction with more than one step, just like when we help organize something important in our community!

Ramadan Food Donation Drive

Scenario:

Your class is part of a **Ramadan Charity Team** helping to collect and organize food boxes for families in need. The goal is to **collect and deliver 800 food boxes** before Eid.

Instructions:

1. Divide students into groups of 3–4. Each group becomes a "Donation Team."

2. Present the problem:
- In Week 1, your class collected **312 food boxes**.
- In Week 2, you collected **427 more boxes**.
- You already delivered **289 boxes** to families.

Ask: *How many food boxes **are still in** the school's storage?*

3. Challenge Extension:
- You want to reach the target of **800 total boxes** before Eid.

Ask: *How many **more boxes** do you need to collect?*

Bonus Challenge:

❖ A nearby school **collected 395 food boxes**. If your class and theirs combine donations and deliver *830 boxes total*, **how many are still left to deliver to reach 1,000?**



Domain
Operations and Algebraic Thinking

Standards
4.OA.A.3 Solve multi-step word problems with whole numbers using all operations. Represent unknowns with letters, interpret remainders, and check answers using mental math and estimation.

SMPs
MPs : **1** and **4**

Key Vocabulary
- multi-step
- strategies
- *process*

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3-9 Solve Multi-Step Problems Involving Addition and Subtraction (cont'd)

Notes / Misconceptions:

- Students may not solve the steps in the **correct sequence**, affecting the final answer.
- Students might use the **wrong operation** (e.g., *adding instead of subtracting*) due to misunderstanding keywords or context.
- The last key vocab word (*process*) in purple is an **academic term**—it's helpful to support students in understanding and using it correctly.

Resources:

Mastery Level Activity: *Game Station Resource Book* on Reveal platform.

Domain
Operations and Algebraic Thinking

Standards
4.OA.A.3

SMPs
MPs : **1** and **4**

Key Vocabulary
- multi-step
- strategies
- *process*

Basic Numeracy Skills

- Solving two-step problems.
- Adding & subtracting multi-digit whole numbers.

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Multiplication as Comparison

Notes & Guidance

Unit 4
Students use multiplication and division to understand phrases like *times as many* and *times as much*, often using bar models to show how one quantity compares to another (e.g.,$4 \times 6 = 24$).
They learn that these comparisons apply to both multiplication and division and use equations to solve problems, even when the unknown is in any position.
It's important to clarify that "times as great as" means multiplication (e.g.,$5 \times 6 = 30$), while "times greater than" usually means adding that product to the original number (e.g.,$6 + 30 = 36$). Although used interchangeably in everyday language, students need to understand the difference.

Pedagogy

- **Use of Visual Representations:** Incorporate bar models and number lines to help students see the relationship between quantities.
- **Concrete-Pictorial-Abstract (CPA) Approach:** Begin with physical objects (counters or cubes), move to visual models (bar diagrams), then transition to equations.
- **Peer Collaboration:** Encourage pair or group work where students explain comparisons to one another using models or equations.
- **Formative Assessment**: Use exit tickets, quick checks, or mini-whiteboards to assess understanding during lessons.
- **Interactive Questioning:** Use guiding questions to prompt students to explain their thinking and compare quantities verbally.

Key Skills & Learning Goals

- ✓ **Interpreting multiplicative language.**
- ✓ **Write equations for word problems:**

  Example:
  If a rope is 5 times as long as a 3-meter cord, write $5 \times 3 = 15$
- ✓ **Compare quantities mathematically:**

  Example:
  "Is 36 five times as great as 6?" Check by calculating $6 \times 5 = 30$ (**so, no**)
- ✓ **Distinguishing between "*times as many*" and "*times greater than*".**
- ✓ **Explaining reasoning orally and in writing.**

International Assessment Links

IEA TIMSS **Whole Numbers** Interpret multiplication as comparison, represent multiplicative relationships using models and equations, and solve word problems involving comparison situations.

PISA **Arithmetic Operations** The nature and properties of these operations and related notational conventions.

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Unit 4 – Multiplication as Comparison
Learning Objectives & Criteria

Unit Goal:
Solve multiplicative comparison problems using multiplication and division, understanding terms like ***times as many*** and ***times greater than***, and apply this to write and solve equations.

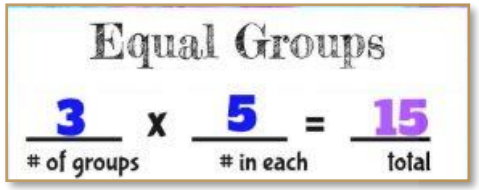
Learning Objective (LO)	Common Core State Standard	Formative Assessment Criteria
Represent multiplication as comparison.	4.OA.A.1 Interpret a multiplication equation as a comparison, e.g., interpret 35 = 5 × 7 as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as multiplication equations. 4.OA.A.2 Multiply or divide to solve word problems involving multiplicative comparison, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison from additive comparison.	Represents a multiplication equation as a comparison by identifying the two quantities, using correct comparative language.
Represent multiplicative comparison statements as multiplication equations.		Write a multiplication equation to match a comparison sentence (understand who has more and who has the base amount, use the correct numbers and multiplication then write the equation clearly).
Use multiplication equations to represent multiplicative comparison.		Use a multiplication equation to show how one quantity is a number of times greater than another. Example: Ali has 4 times as many books as Sam. Sam has 6 books.
Distinguish between multiplicative and additive comparison.		Identify whether a comparison is additive (*how much more*) or multiplicative (*how many times more*) and choose the correct operation.
Solve multiplicative comparison problems by using multiplication.		Solve word problems involving multiplicative comparisons by identifying the correct quantities and using multiplication to find the total.
Solve multiplicative comparison problems by using division.		Solve multiplicative comparison problems by using division to find the unknown when the total and either the divisor or the quotient is given. Example: Lena has 24 marbles. That's 4 times as many as Noor has. How many marbles does Noor have?

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4-1 Understand Comparing with Multiplication

Learning Objectives
Students should be able to:

- Represent multiplication as comparison.
- Represent multiplicative comparison statements as multiplication equations.



Towards Mastery

I can compare two groups using multiplication and write multiplication equations to describe the comparison.

Stick Statements

Preparation Steps:

- Gather number cubes (dice), counters or linking cubes.
- Have cards labeled with numbers if no dice are available.

Instructions:

1. **Pair Up:** Students work in pairs and each pair gets 1 number cube (die) and a pile of counters/cubes.
2. **Roll & Build Group 1**: One student rolls the number cube. Then, build a group of counters to match that number. **(e.g., If the roll is 4, they place 4 counters in Group1).**
3. **Roll & Build Group 2**: Roll the number cube again to determine how **many times more** Group 2 will be than Group 1. Then, **multiply the first number** by the second roll to get the total counters for Group 2 and build Group 2.
4. **Write the Equation & Comparison Statement:**

- Write a **multiplication equation** for the relationship.
- Then, write a **multiplicative comparison statement**.
- Swap and repeat.

Check and Connect:

➢ Ask: **"What would happen if you added instead of multiplied?"**

Mastery

Accurately represent multiplicative comparison situations with equations and clearly explain the relationship between the quantities.

Multiplication Comparison Task Cards (Game Station Activity)

Lesson Reference: Lesson 4-1
Pages: 52 to 57
Source: *Game Station Resource Book*



Beyond Mastery

I can use multiplication to compare two quantities and explain how many times one is bigger than the other.

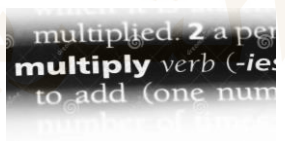
Falconry School Comparison Challenge

Instructions:

1. Prepare number cards (1 – 10) and present the following problem:
"At one falconry school in the desert, there are **3 trained falcons**. Another larger school has **5 times as many falcons**. How many falcons are at the *larger school*?"

2. Ask students to:

- Write a **multiplication equation** to solve it.
- Create a comparison statement using the phrase "***times as many.***"
- **Draw** a visual model (like equal groups or bar models).





Bonus Challenge: Falconry Expansion Plan

❖ The larger falconry school wants to **double** the number of trained falcons next year. **How many** trained falcons will they have then? How **many more** falcons will that be **compared to the smaller school**?

Domain
Operations and Algebraic Thinking

Standards
4.OA.A Use the four operations with whole numbers to solve problems.
4.OA.A.1 Interpret a multiplication equation as a comparison.

SMPs
MP: **2**

Key Vocabulary
- multiplicative comparison
- *state*

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4-1 Understand Comparing with Multiplication (cont'd)

Notes / Misconceptions:

- Thinking "*times as many*" means addition: Students may incorrectly add the numbers instead of multiplying (e.g., **3 times as many as 4 = 3 + 4 = 7** *instead of* **3 × 4 = 12**).
- The last key vocab word (*state*) in purple is an **academic term**—it's helpful to support students in understanding and using it correctly.

Resources:

Mastery Level Activity: *Game Station Resource Book* on Reveal platform.

Domain
Operations and Algebraic Thinking

Standards
4.OA.A and **4.OA.A.1**

SMPs
MP: **2**

Key Vocabulary
- multiplicative comparison
- *state*

Basic Numeracy Skills

- Understand multiplication as equal groups.
- Know what "*times as many*" means.

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4-2 Represent Comparison Problems

Learning Objectives

Students should be able to:

- Use multiplication equations to represent multiplicative comparison.
- Distinguish between multiplicative and additive comparison.

Towards Mastery

I will translate "more than" and "times" into addition and multiplication to create and solve math problems and write equations for them.

Show the Comparison

Preparation:

- **Materials**: Number cards (0 to 9), Index cards ("*more than*," "*times*") for each pair.
- **Grouping:** Pairs



Instructions:

1. Give each pair a number & an index card.
2. Problem Creation:
- Students pick a number card (starting number)
- Then, choose an index and another number card (e.g., **5**, "***more than***", **3**).
3. Equation Writing & Repeat:
- Students write an equation.
- Addition: *more than* ; Multiplication: *times*.



Check and Connect:

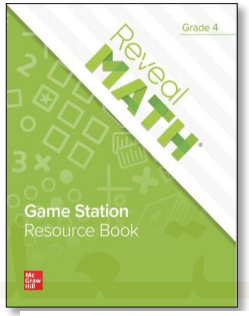
➢ Ensure correct matching of words and operations and check equation accuracy.

Mastery

Use multiplication equations to represent situations and clearly explain the difference between multiplicative & additive comparisons.

Multiplication Comparison Drawing Task Cards (Game Station Activity)

Lesson Reference: Lesson 4-2
Pages: 58 to 62
Source: *Game Station Resource Book*







Beyond Mastery

I can solve and show comparison problems using addition and multiplication and explain my thinking using equations.

Date Farm Math Masters

Story Setup:

"In Al Ain, Farmer Ayesha harvested 240 kg of dates. Farmer Saeed harvested ***3 times as many*** dates. Farmer Khalid harvested ***150 kg more than*** Ayesha. How much did Saeed and Khalid harvest? Who harvested more?"

Instructions:

1. Represent:
- Multiplicative Comparison: **(Saeed = 3 × Ayesha)**
- Additive Comparison: **(Khalid = Ayesha + 150)**

2. Write equations:
- **Saeed:** $3 \times 240 = ?$
- **Khalid:** $240 + 150 = ?$

3. Compare the totals to determine who harvested **the most**.



Bonus Challenge:

❖ The three farmers—Ayesha, Saeed, and Khalid—want to send their dates to the UAE Date Festival in Liwa. The packaging company puts **60 kg of dates in each box.**
- ➢ How many boxes does each farmer need?
- ➢ If the festival charges **15AED per box for shipping**, how much will each farmer pay?

Domain
Operations and Algebraic Thinking

Standards
4.OA.A.1 Interpret a multiplication equation as a comparison.
4.OA.A.2 Multiply or divide to solve word problems involving multiplicative comparison.

SMPs
MP: **4**

Key Vocabulary
- additive comparison
- multiplicative comparison

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4-2 Represent Comparison Problems (cont'd)

Notes / Misconceptions:

❖ Reversing the comparison (mixing up **who has more or less**). Example: "**Ahmed has 150kg more than Fatima**" → students might *subtract 150 from Ahmed's total* instead of **adding it to Fatima's**.

Resources:

Mastery Level Activity: *Game Station Resource Book* on Reveal platform.

Domain
Operations and Algebraic Thinking

Standards
4.OA.A.1 and **4.OA.A.2**

SMPs
MP: **4**

Key Vocabulary
- additive comparison
- multiplicative comparison

Basic Numeracy Skills

- Compare quantities.
- Translate words into equations.

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4-3 Solve Comparison Problems Using Multiplication

Learning Objectives

Students should be able to:

- Solve multiplicative comparison problems by using multiplication.



Towards Mastery

Students will represent multiplicative comparison situations using number cubes and express their understanding through equations and statements.

What's the Statement?

Preparation:

- Prepare 2 number cubes (dice) per pair of students.
- Create sentence frames:

"The number ___ is ___ times as much as the number ___."

Instructions:

1. **Pair up students. One student rolls both cubes**, then secretly hides one and shows the other.
2. The student **multiplies the two numbers** and tells their partner the product and the visible number. Example: If they roll 3 and 5, they hide 3, show 5, and say the product is 15.
3. The other student must **figure out the hidden number** and **write a multiplicative comparison statement** using the frame: "The number 15 is 3 times as much as the number 5."
4. **Switch roles** and repeat with new rolls. Watch for students who **place the product last rather than first.**





Check and Connect:

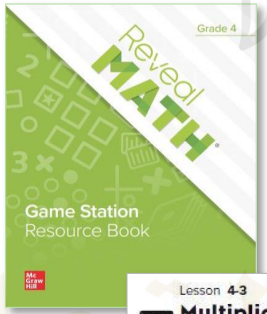
➢ End with a quick reflection: **"What helps you know when to use multiplication in a comparison?"**

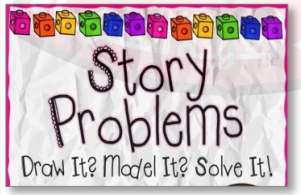
Mastery

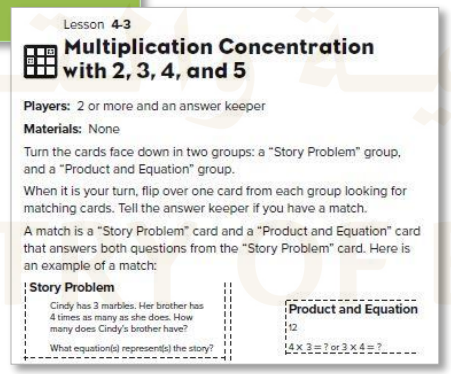
Accurately solve multiplicative comparison problems using multiplication and clearly explain the comparison being made.

Multiplication Concentration with 2, 3, 4 and 5 (Game Station Activity)

Lesson Reference: Lesson 4-3
Pages: 63 to 67
Source: *Game Station Resource Book*







Beyond Mastery

I can interpret, model, and solve word problems that compare two amounts using multiplication.

Pearl Diver Comparison Challenge

Scenario:

Ali went diving and collected **18 pearls** during his trip. His grandfather tells him that in his younger days, he could collect **4 times as many pearls** in one trip.

Instructions:

1. Think and Solve:
   - How many pearls did Ali's grandfather collect?
   - Write a **multiplication equation** to show your thinking.
2. Represent:
   - **Draw** a bar model (or number line) to represent the comparison.
   - Use the sentence frame:
     "Ali's grandfather collected ___ times as many pearls as Ali. So, ___ × ___ = ___ ".
3. Explain: Work with a partner & explain using mathematical language and check if the comparison makes sense.

Bonus Challenge:

❖ If Ali dives **6 times** in a month, how many pearls does he collect in total? How many more pearls did his grandfather collect **in just one trip** compared to **Ali in a month**?

Extension (for deeper reasoning):

❖ If Ali wanted to collect as many pearls in a month as his grandfather used to collect in one trip, how many pearls would he need to collect **each trip**?

Domain
Operations and Algebraic Thinking

Standards
4.OA.A Use the four operations with whole numbers to solve problems.
4.OA.A.2 Multiply or divide to solve word problems involving multiplicative comparison.

SMPs
MP: **4**

Key Vocabulary
- bar diagram
- unknown
- *vary*

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4-3 Solve Comparison Problems Using Multiplication (cont'd)

Notes / Misconceptions:

- Ensure students **do not reverse** the factor and the product.
- Misunderstanding the phrase "***times as many***".
- The last key vocab word (*vary*) in purple is an **academic term**—it's helpful to support students in understanding and using it correctly.

Resources:

Mastery Level Activity: *Game Station Resource Book* on Reveal platform.

Domain
Operations and Algebraic Thinking

Standards
4.OA.A and **4.OA.A.2**

SMPs
MP: **4**

Key Vocabulary
- bar diagram
- unknown
- *vary*

Basic Numeracy Skills

- Bar diagrams.
- Word problems involving multiplication.

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4-4 Solve Comparison Problems Using Division

Learning Objectives

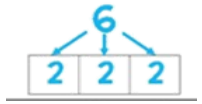
Students should be able to:

- Solve multiplicative comparison problems by using division.

Towards Mastery

*I can write multiplication and division equations to compare numbers and explain what "**times as much**" means using number cubes.*

What's the Equation?



Preparation:

- Prepare 2 number cubes per group.
- Equation sentence frame: " ___ is ___ times as much as ___."

Instructions:

1. **Group students** and give each group **2 number cubes.**
2. **One student** rolls both cubes, then **hides one result** and shows the other.
3. Multiply the numbers to find the **product** and write it down.
4. Students then use the **visible number** and **product** to write a **division equation** (e.g., $24 \div 6 = 4$).
5. Guide them to write the **matching multiplication equation.**
6. Using the sentence frame, they write a **comparison statement**: **"24 is 4 *times as much as* 6."** Then, **repeat.**



Check and Connect:

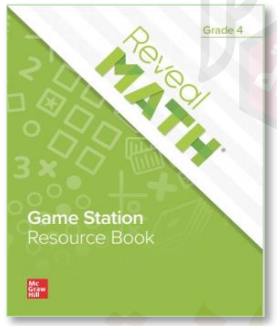
- Ask: **"How did you figure out which number was being compared?"**
- Watch for understanding that "*times as much*" can describe both multiplication and division.
- Review and correct any **reversal of numbers** or **confusion between the product and the factor.**

Mastery

Correctly solve multiplicative comparison problems using division and clearly explain how one quantity compares to another.

Multiply and Divide by 2 Tic Tac Toe (Game Station Activity)

Lesson Reference: Lesson 4-4
Pages: 68 to 70
Source: *Game Station Resource Book*





Lesson 4-4
Multiply and Divide by 2 Tic Tac Toe

Players: 2 and an answer keeper

Materials: none

Directions: Choose who will go first. Then decide who will be X and who will be O.

Choose a box and find the product or quotient. The answer keeper checks your answer with the answer key. If you are correct, draw your X or O in the box. Take turns solving and filling in the boxes. Whoever gets 3 in a row first wins. You may choose another game and play again.

Beyond Mastery

***Solve, interpret** & **model** comparison problems using **division** by connecting to real-life scenarios.*

Henna Cones Sold

Scenario:

A traditional henna shop in Dubai sold **90 henna cones** in one day. Each customer bought **10 cones**. How many times more cones did the shop sell compared to what one customer bought?

Instructions:

1. Ask students to:
   - **Model** the scenario using blocks or drawings (e.g., 90 cones **divided into groups** of 10).
   - **Write a division equation** to represent the situation: $90 \div 10 = ?$
   - **Interpret** the result in a comparison sentence: "The shop sold 9 times *as many cones as* one customer bought."
2. Have groups **present** their models and explain their reasoning using division and a comparison statement.
3. Reinforce the structure: " ___ is ___ times as many as ___" and encourage students to identify the **number of groups** vs. the **size of one group**.



Bonus Challenge:

- A henna shop in Abu Dhabi sold **120 henna cones** in the morning and **60 cones** in the afternoon. Each customer buys **15 cones**. How many times more cones did the shop sell compared to what one customer bought?

Domain
Operations and Algebraic Thinking

Standards
4.OA.A Use the four operations with whole numbers to solve problems.
4.OA.A.2 Multiply or divide to solve word problems involving multiplicative comparison.

SMPs
MP: **5**

Key Vocabulary
- bar diagram
- unknown
- *correspond*

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4-4 Solve Comparison Problems Using Division (cont'd)

Notes / Misconceptions:

- Misunderstanding the phrase "***times as many***".
- Students may ***reverse the dividend and divisor***, leading to incorrect answers (e.g., **using** $3 \div 15$ *instead of* $15 \div 3$).
- The last key vocab word (*correspond*) in purple is an **academic term**—it's helpful to support students in understanding and using it correctly.

Resources:

Mastery Level Activity: *Game Station Resource Book* on Reveal platform.

Domain
Operations and Algebraic Thinking

Standards
4.OA.A and **4.OA.A.2**

SMPs
MP: **5**

Key Vocabulary
- bar diagram
- unknown
- *correspond*

Basic Numeracy Skills

- Division facts within 100.
- Word problems involving multiplication.

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Numbers and Number Patterns

Notes & Guidance

Unit 5
Students will learn to find **factor pairs** of numbers using *multiplication* and use them to classify numbers as **prime** or **composite**. They will also explore the relationship between **factors** and **multiples** to find multiples. The unit also covers identifying, describing, and extending **shape and number patterns** by creating and applying pattern rules, and analyzing patterns using their understanding of factors and multiples.

Pedagogy

- **Use of Visual Representations:** Use pictures and diagrams (arrays, charts) to illustrate factors, multiples, and patterns.
- **Hands-on Activities:** Students physically manipulate objects to understand patterns and relationships.
- **Collaborative Learning:** Encourage students to work in groups to discover and discuss concepts.
- **Formative Assessment**: Use exit tickets, quick checks, or mini-whiteboards to assess understanding during lessons.
- **Explicit Instruction:** Directly teach key terms and strategies when needed.
- **Differentiation:** Offer varied support and activities for different learners.

Key Skills & Learning Goals

- ✓ **Find factor pairs and multiples.**
- ✓ **Understand the relationship between factors and multiples:**

  Example:

  3 is a **factor** of 15 (because $3 \times 5 = 15$), and
  45 is a **multiple** of 15 (because $15 \times 3 = 45$).

- ✓ **Identify prime and composite numbers:**

  Example:

  7 is **prime** (*only* 1 and 7 are factors); 10 is **composite** (factors: 1, 2, 5, 10).

- ✓ **Describe, extend, and analyze patterns.**

International Assessment Links

IEA TIMSS

Whole Numbers Identify, extend, and describe number patterns; use rules in number sequences; and relate patterns to place value and operations.

PISA

Numbers and Units Understanding number concepts and systems, including converting between them and using numbers to describe real-world quantities.

Arithmetic Operations The nature and properties of these operations and related notational conventions.

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Unit 5 – Numbers and Number Patterns
Learning Objectives & Criteria

Unit Goal:
Find factor pairs, identify primes and multiples, and analyze patterns using multiplication and pattern rules.

Learning Objective (LO)	Common Core State Standard	Formative Assessment Criteria
Use an understanding of multiplication to determine all factor pairs of a whole number.	4.OA.B.4 Find all factor pairs for a whole number in the range 1-100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1-100 is a multiple of a given one-digit number. Determine whether a given whole number in the range 1-100 is prime or composite. 4.OA.C.5 Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself.	Accurately identify and list all factor pairs of a given whole number. Example: For the number 36, the student correctly writes: (1, 36), (2, 18), (3, 12), (4, 9), (6, 6) - showing a complete and accurate understanding of factor pairs.
Identify a whole number as prime or composite based on the number of factor pairs it has.		Determine whether a number is prime or composite by identifying the correct number of factor pairs. Example: For the number 7, the student states: "7 has only one factor pair: (1, 7), so it is a prime number."
Determine whether a whole number is a multiple of a given number.		Correctly identify if a number is a multiple of a given number using multiplication facts.
Recognize, extend, and describe a number or shape pattern.		Clearly explain the rule of a number or shape pattern using correct mathematical language, showing they understand how the pattern changes.
Generate a number or shape pattern from a given rule.		Accurately create a number or shape pattern by applying the given rule consistently, demonstrating a clear understanding of the rule's effect on each term.
Identify and explain features of a number or shape pattern.		Identify and describe how the pattern changes (e.g., increasing by 3, alternating shapes), and clearly explain the rule governing the pattern. Example: For the pattern 2, 5, 8, 11, 14…, a student explains: "The pattern increases by 3 each time. I add 3 to get the next number."

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5-1 Understand Factors of a Number

Learning Objectives

Students should be able to:

- Use an understanding of multiplication to determine all factor pairs of a whole number.

Towards Mastery

Find all factor pairs of a whole number.

How Many Ways?

Preparation:

- **Materials**: 12 paper clips per group, paper and pencils.
- **Grouping:** Small groups (3-4 members).

Instructions:

1. Introduction (~5 minutes):

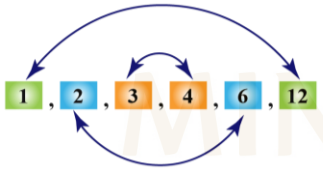
- Ask students **what a factor is** and introduce the problem: Find ways to arrange 12 paper clips into equal groups to find factor pairs of 12.

2. Exploration:

- Give each group 12 paper clips and guide students to make **equal groups**, starting with **1 group of 12** and so on.
- Record each arrangement as an equation (e.g., $2 \times 6 = 12$).

3. Discussion:

- Discuss the arrangements and explain that when the **factors reverse**, *all factor pairs are found*.
- Define "**factor pair**" and identify factor pairs of 12.



Check and Connect:

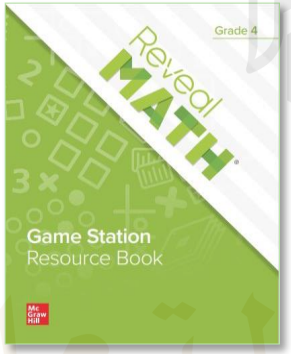
- Ask students to **explain factor pairs** and give examples.
- Relate to **multiplication**.

Mastery

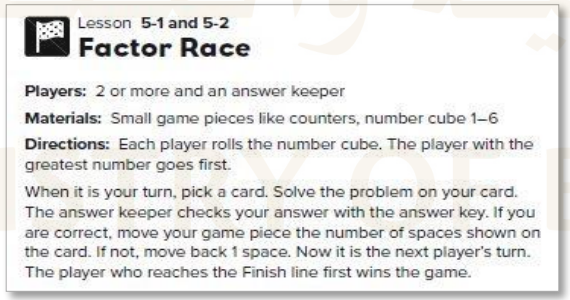
Accurately identify all factor pairs of a whole number using understanding of multiplication and explain the reasoning.

Factor Race (Game Station Activity)

Lesson Reference: Lessons 5-1 and 5-2
Pages: 71 to 76
Source: *Game Station Resource Book*







Beyond Mastery

I can find and model all factor pairs of a number and explain how they are used to make equal groups in real-life situations.

Souq Stalls and Factor Tiles

Scenario:

In traditional Emirati souqs (markets), shopkeepers arrange products like dates, or perfumes in **equal rows and columns.** Students will become *Souq Stall Designers*, arranging products using different factor combinations.

Instructions:

1. Prepare a set of number cards (12, 18, 24, 30, etc) and each student draws a card.
2. Design *all possible equal arrangements* (arrays) of that number of items as if setting up a souq stall. Example: For 24, they might design; 1×24, 2×12, etc....
3. Students must draw or build **each arrangement** and label it with the factor pair.
4. Then, they write a short story or explanation: "I displayed 24 packs of dates. I could arrange them in 4 rows with 6 in each row, or in 6 rows with 4 in each row."

Bonus Challenge:

❖ Students receive a "Souq Owner's Dilemma" card: "You have 30 bottles of oud perfume. You want each display to have the **same number of bottles**, but **no more than 5 in each row**. How many different ways can you arrange them?"

Domain
Operations and Algebraic Thinking

Standards
4.OA.B.4 Find factor pairs for numbers 1–100. Identify multiples and determine if numbers are prime or composite.

SMPs
MP: **4**

Key Vocabulary
- factor
- factor pairs
- *predict*



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5-1 Understand Factors of a Number (cont'd)

Notes / Misconceptions:

- Students may not list **all factor pairs;** only identify 1 and the number itself as factors.
- Students may assume all numbers have pairs of factors **other than 1 and itself -** "prime numbers".
- The last key vocab word (*predict*) in purple is an **academic term**—it's helpful to support students in understanding and using it correctly.

Resources:

Mastery Level Activity: *Game Station Resource Book* on Reveal platform.

Domain
Operations and Algebraic Thinking

Standards
4.OA.B.4

SMPs
MP: **4**

Key Vocabulary
- factor
- factor pairs
- *predict*

Basic Numeracy Skills

- Multiply and divide within 100.
- Multiplicative comparison problems.

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5-2 Understand Prime and Composite Numbers

Learning Objectives

Students should be able to:

- Identify a whole number as prime or composite based on the number of factor pairs it has.

Towards Mastery

I can find and name factor pairs of numbers up to 100 and tell if a number is prime or composite.

Number Volley

Preparation Steps:

- Prepare a soft ball/cards labeled with numbers from 1 to 100
- Clear space in the class/arrange seats in a circle.
- Review factor pairs and prime vs. composite numbers.

Instructions:

1. One student "serves" by drawing a card or tossing the ball.
2. The student who catches it checks the number nearest to their right thumb (or reads the card).
3. That student says a **factor pair** of the number out loud.
4. Another student gives a **different factor pair** for the *same number*, or says it is **prime if no more pairs exist**.
5. Continue until **all factor pairs are identified**.
6. Encourage students to notice and share patterns like **even numbers or multiples of 5.**



Check and Connect:

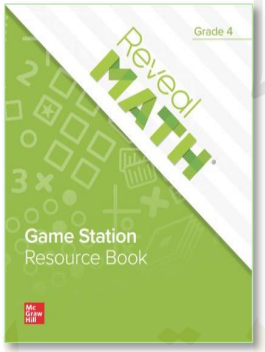
- Ask: **"How do you know those are factor pairs?"** and **"What helped you decide if the number is prime or composite?"**
- After the activity, challenge students to reflect: **"What patterns did you notice with even or odd numbers?"**

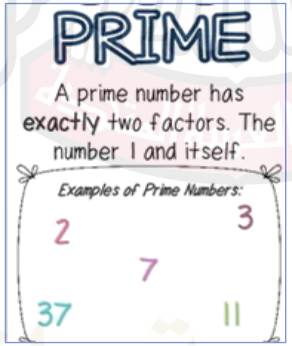
Mastery

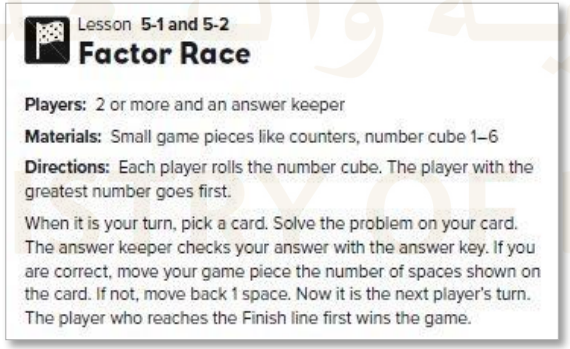
Correctly determine whether a whole number is prime or composite by identifying and analyzing its factor pairs.

Factor Race (Game Station Activity)

Lesson Reference: Lessons 5-1 and 5-2
Pages: 71 to 76
Source: *Game Station Resource Book*







Beyond Mastery

I can identify prime and composite numbers by finding all factor pairs and explain how I know using math vocabulary.

Souq Number Hunt: Prime or Composite?

Activity Setup:

- Prepare:

1. Cards or printouts with pictures of Emirati market items (e.g., oud bottle, henna cone, falcon hood) each labeled with a number from 1 to 100.
2. Small baskets/trays to display the item cards (mini souq).
3. Recording sheet for factor pairs and classification (prime or composite).

Instructions:

1. **Set up stations** like market stalls with traditional item cards spread out.
2. Each card has a number (e.g., 29 on a falcon hood).
3. Students visit the stalls in pairs and:

- Pick an item, then list **all factor pairs of the number** on their recording sheet.
- Decide whether it is **prime or composite and justify their answer with math reasoning.**





Bonus Challenge:

- At the end, high achievers receive a "*secret shopper list*" with clues like:

"I want an item that's **a prime number between 40 and 60**."

- Ask: "Can a number be **both prime and even**?"

Domain
Operations and Algebraic Thinking

Standards
4.OA.B Gain familiarity with factors and multiples.
4.OA.B.4 Find factor pairs for numbers 1–100. Identify multiples and determine if numbers are prime or composite.

SMPs
MP: **7**

Key Vocabulary
- composite number
- factor pairs
- prime number

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5-2 Understand Prime and Composite Numbers (cont'd)

Notes / Misconceptions:

- Students *may think* that **all odd numbers are prime**.
- Thinking 1 is a prime number - students often think that 1 is prime because *it's not divisible by any number except itself*. But **prime numbers must have *exactly two* distinct factors**: 1 and itself – and 1 only has one factor.

Resources:

Mastery Level Activity: *Game Station Resource Book* on Reveal platform.

Domain
Operations and Algebraic Thinking

Standards
4.OA.B and **4.OA.B.4**

SMPs
MP: **7**

Key Vocabulary
- composite number
- factor pairs
- prime number

Basic Numeracy Skills

- Multiply and divide within 100.
- Find all factor pairs of a whole number.

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5-3 Understand Multiples

Learning Objectives

Students should be able to:

- Determine whether a whole number is a multiple of a given number.



Towards Mastery

Find and list multiples of a number by skip counting.

Mighty Multiples

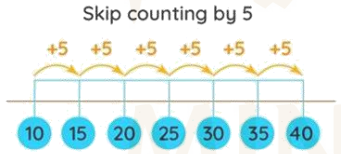
Preparation Steps:

- **Materials**: Whiteboards and markers (1 per group).
- **Grouping:** Pairs
- **Prior Knowledge**: Basic multiplication factors for 2-5

Instructions:



1. Introduction (~5 minutes):
- Review multiples: "What's a multiple?"
2. Activity:
- In pairs, one student picks a number (2-5).
- Both write **3 multiples** and **2 non-multiples** of that number.
- Partners exchange boards, **circle multiples**, and **explain**.
3. Discussion:
- Share numbers and how multiples were identified (e.g., **"12 is a multiple of 3 because $3 \times 4 = 12$"**).



Check and Connect:

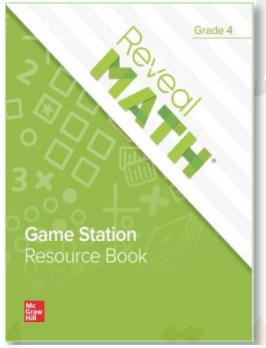
- Observe if students correctly **identify multiples**.
- Ask: "Is 20 a multiple of 4? Why?"
- Relate to **multiplication**.

Mastery

Accurately identify whether a whole number is a multiple of a given number and explain reasoning using multiplication facts.

Multiples Bingo (Game Station Activity)

Lesson Reference: Lessons 5-3
Pages: 77 to 80
Source: *Game Station Resource Book*



Game 1 Player 1				
14	12	88	9	35
4	64	25	50	42
45	30	Free Space	63	27
80	36	20	48	55
22	72	132	6	120

Lesson 5-3
Multiples Bingo

Players: 2 and an answer keeper

Materials: Small game pieces like counters

Directions: Take turns picking a card and turning it face up. Look at your bingo boards to see if there is a match. A match on your bingo board is a multiple of the number shown on the card. The answer keeper checks your answer with the answer key. If there is a match, cover it with a counter. Play continues until someone has bingo. Bingo can be a complete row or column, or 4 corners. If you run out of cards before someone has bingo, shuffle the cards and continue playing.

Beyond Mastery

I can explore and explain patterns in multiples of whole numbers and apply my understanding to solve real-world problems connected to UAE culture and landmarks.

Desert Caravan Multiples Quest

Scenario:

In a certain desert, each caravan has **8 camels**. A Bedouin tracker needs to organize **multiple caravans** for a parade. Your task is to find the total number of camels in different numbers of caravans and discover the **pattern of the multiples of 8**.

Instructions:

1. Use a multiplication table or repeated addition to list the **first 10 multiples of 8** (e.g., 8, 16, 24…).
2. Write a sentence for each:
"If there are_____caravans, there are _____ camels."
3. Color-code the even multiples.
4. Find a **pattern** and explain it in your own words.
5. If there are **72 camels**, how many caravans are there?

Bonus Challenge:

- Each camel needs **3 liters of water** and **2 sacks of food** for the parade.
  - If there are **56 camels**, how many liters of water and sacks of food are needed *in total*?
  - The supply truck can carry **100 liters of water** and **80 sacks of food** per trip. **How many trips** does the truck need to make to carry all the supplies?

Domain
Operations and Algebraic Thinking

Standards
4.OA.B Gain familiarity with factors and multiples.
4.OA.B.4 Find factor pairs for numbers 1–100. Identify multiples and determine if numbers are prime or composite.

SMPs
MP: **8**

Key Vocabulary
- factor
- multiple
- product

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5-3 Understand Multiples (cont'd)

Notes / Misconceptions:

- Students may list **factors instead of multiples**, confusing the two concepts (e.g., saying 3 is a multiple of 12).
- Assuming **non-listed numbers aren't multiples** - If a number isn't in the list of the **first few multiples**, students may wrongly conclude it's not a multiple.

Resources:

Mastery Level Activity: *Game Station Resource Book* on Reveal platform.

Domain
Operations and Algebraic Thinking

Standards
4.OA.B and **4.OA.B.4**

SMPs
MP: **8**

Key Vocabulary
- factor
- multiple
- product

Basic Numeracy Skills

- Represent multiplication as equal groups.
- Decompose numbers into factors and factor pairs.

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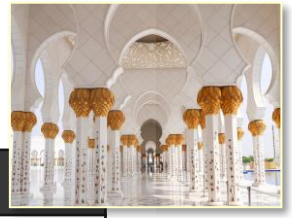
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5-4 Number or Shape Patterns

Learning Objectives

Students should be able to:

- Recognize, extend, and describe a number or shape pattern.



Towards Mastery

Students will recognize and continue patterns that increase by a constant value.

What Comes Next?

Preparation Steps:

- **Materials**: Items to count with. **Grouping:** Small groups.

Instructions:

1. Let's talk about patterns – we're going to use counters to make a pattern and **find out what comes next**.
2. Your group will use the counters to build a pyramid that has **4 rows**: **Row 1**: 1 counter / **Row 2**: 3 counters / **Row 3**: 5 counters / **Row 4**: 7 counters
   - Write down how many counters you use for **each row and t**alk about how the number *changes as you **add more rows***.
3. What's the pattern? After you build the pyramid, answer:
   - How many counters are in **each row**? How does the number of counters **change**? What's the **rule for our pattern**?
   - How many counters do you think will be in **row 5**? Now, build row 5 to check.
4. What comes next? Work with your group to figure out how **many counters** you would need for **row 6 and row 7**.

Check and Connect:

➢ Ask: **"How did you know how many counters would be in *row 5*?**

Numerical Pattern

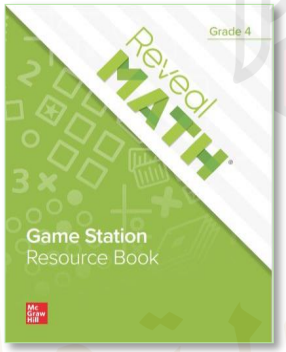
a series of numbers that follows a certain rule

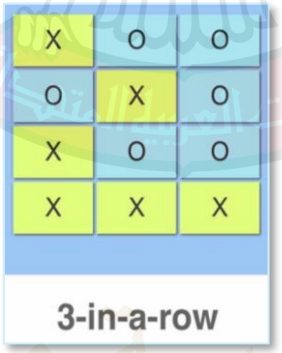
Mastery

Identify, continue, and explain a number or shape pattern using a clear rule or relationship.

Next Number Tic Tac Toe (Game Station Activity)

Lesson Reference: Lessons 5-4 and 5-5
Pages: 81 to 82
Source: *Game Station Resource Book*





Lesson 5-4 and 5-5

Next Number Tic Tac Toe

Players: 2 and an answer keeper

Materials: none

Directions: Choose who will go first. Then decide who will be X and who will be O.

When it is your turn, choose a box and say the number that comes next in the pattern. The answer keeper checks your answer with the answer key. If you are correct, draw your X or O in the box. Take turns solving and filling in the boxes with Xs and Os. Whoever gets 3 in a row first wins. You may choose another game and play again.

Beyond Mastery

I can recognize, extend, and describe number or shape patterns by analyzing geometric designs from UAE mosques.

Tile It Like a Designer

Activity Setup:

1. Display several images of **UAE mosque tiles** showing **repeating geometric patterns** (e.g., Sheikh Zayed Mosque).
2. Prepare **pattern blocks/tiles** (*physical or digital*) and a **pattern rule chart** (e.g., rotate, change colors in order).

Instructions:

1. Hook/Connect:
   - Show a tiled wall or floor from a famous UAE mosque.
   - Ask: "What shapes do you see? Do they follow a **pattern**? How would you **extend it**?"
2. Explore the Pattern: In pairs, students study a tile design and record:
   - What shapes repeat? What rule do they follow? (e.g., hexagon, triangle,..). Is there rotation, symmetry, or color pattern?



Bonus Challenge – Create Your Own:

- Students create their own **pattern tile strip** using blocks or on grid paper, following a mathematical **pattern rule.**
- Write the **pattern rule** in words/numbers (e.g., "Each tile has 1 more side than the one before" → triangle → square → pentagon).

Domain
Operations and Algebraic Thinking

Standards
4.OA.C Generate and analyze patterns.
4.OA.C.5 Create number or shape patterns based on a rule and identify hidden features in the pattern.

SMPs
MP: **7**

Key Vocabulary
- pattern
- pattern rule
- sequence

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5-4 Number or Shape Patterns (cont'd)

Notes / Misconceptions:

- Some students may confuse the **position of a term with its value** – for example, thinking that the 3rd term in a pattern must be 3.
- Remind students that a **pattern rule must work for every term** in the sequence.

Resources:

Mastery Level Activity: *Game Station Resource Book* on Reveal platform.

Domain
Operations and Algebraic Thinking

Standards
4.OA.C and **4.OA.C.5**

SMPs
MP: **7**

Key Vocabulary
- pattern
- pattern rule
- sequence

Basic Numeracy Skills

- Skip counting.
- Determine similarities in groups of numbers.
- Patterns based on factors or multiples.

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5-5 Generate a Pattern

Learning Objectives

Students should be able to:

- Generate a number or shape pattern from a given rule.

Towards Mastery

I can find and extend number patterns using rules like "add" or "multiply" and explain how the pattern grows.

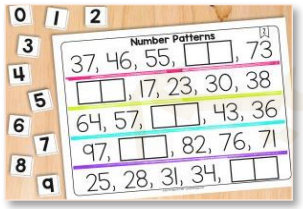
How Does it Look?

Preparation Steps:

- Prepare number cubes or a whiteboard.
- Write sample pattern rules (e.g., **add 4**, **multiply by 3**).

Instructions:

1. **Introduce the idea of pattern rules** (e.g., "add 4") and model how to find terms *starting from a given number*.
2. Allow students to pick or be **given a rule** and **a starting number** and ask them to write the **first five terms** of the *pattern* on their sheet.
3. Once they are confident with addition patterns, introduce **multiplication rules** (e.g., "multiply by 3").
4. Students share their patterns with a partner and **describe the rule they used.**



Check and Connect:

- Ask: **"What pattern do you notice?"**
- Check: **Can the student apply the rule consistently to generate each term?**

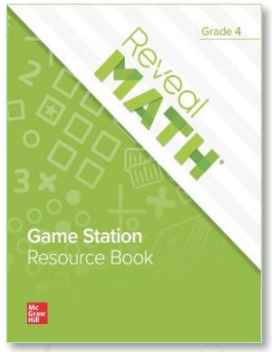
Extension: Ask students to **create their own rule** and challenge a peer to *continue the pattern*.

Mastery

Accurately create a number or shape pattern by applying a given rule and explain how the rule generates the pattern.

Next Number Tic Tac Toe (Game Station Activity)

Lesson Reference: Lessons 5-4 and 5-5
Pages: 81 to 82
Source: *Game Station Resource Book*



Game 3		
3 1 3 1 3 1	2 4 6 8 10	0 11 22 33
1 5 9 13 17	3 6 9 12 15	4 8 12 16
101 111 121	85 90 95	0 6 12 18

Lesson 5-4 and 5-5

Next Number Tic Tac Toe

Players: 2 and an answer keeper

Materials: none

Directions: Choose who will go first. Then decide who will be X and who will be O.

When it is your turn, choose a box and say the number that comes next in the pattern. The answer keeper checks your answer with the answer key. If you are correct, draw your X or O in the box. Take turns solving and filling in the boxes with Xs and Os. Whoever gets 3 in a row first wins. You may choose another game and play again.

Beyond Mastery

I can create and explain number/shape patterns by using rules and connect them to real-life situations.

Falcon Flight Patterns

Instructions:

1. Start with a short discussion:
"Falcons are an important part of UAE culture and heritage. Imagine we're tracking the **flight path** of a falcon as it moves across the desert. Each move it makes **follows a pattern**!"

2. Generate the pattern:
   - Each group selects or is given a rule card (e.g., "add 6").
   - Students choose a **starting number** (e.g., 4).
   - Generate the **first 6 terms** of the pattern *using the rule*.
   - They then **draw** a flight path on a map using the numbers as **coordinates or distances**.

3. Extend the pattern:
   - Challenge students to write the pattern in a **table or chart.**
   - Ask them to **identify the pattern rule** and **describe** it in words and numbers.

Bonus Challenge:
A falcon trainer notices a pattern in how far his falcon flies during training sessions. The distances (in meters) form a pattern: **50, 100, 150, 200, ____, ____**

But in the second round of training, the falcon improves and flies in this new pattern: **60, 120, 240, ____, ____**

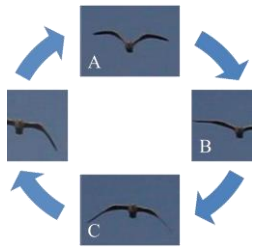
- **What is the rule** in each pattern?
- **Complete the next two distances** for each round.
- **Explain the difference** between the two patterns.

Domain
Operations and Algebraic Thinking

Standards
4.OA.C Generate and analyze patterns.
4.OA.C.5 Create number or shape patterns based on a rule and identify hidden features in the pattern.

SMPs
MP: **8**

Key Vocabulary
- pattern rule
- term



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5-5 Generate a Pattern (cont'd)

Notes / Misconceptions:

- When given *only a rule*, students may default to *starting from 1 or 0* instead of using the **correct starting number**.
- Some students may confuse the **position of a term with its value** – for example, thinking that the 4th term in a pattern must be 4.

Resources:

Mastery Level Activity: *Game Station Resource Book* on Reveal platform.

Domain
Operations and Algebraic Thinking

Standards
4.OA.C and **4.OA.C.5**

SMPs
MP: **8**

Key Vocabulary
- pattern rule
- term

Basic Numeracy Skills

- Fluency with basic operations.
- Numeric and shape patterns.
- Skip counting.

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5-6 Analyze Features of a Pattern

Learning Objectives

Students should be able to:

- Identify and explain features of a number or shape pattern.



Towards Mastery

Create number patterns using a rule & show them in groups.

What Do They Have in Common?

Preparation Steps:

- Counters or small objects (e.g., bottle caps, cubes).
- A blank table for each student or group (**columns**: *Group Number*, *Number of Rows*, *Total Counters*).

Instructions:

1. Start with the rule **"add 2"**, beginning at 2.
2. Ask students to use counters to build groups that follow the pattern: **2, 4, 6, 8, etc**.
3. In each group, arrange the counters in **arrays of 2 per row**.
4. **For each group**: count the *number of rows*, count the *total number of counters* and record the information in the table.
5. Ask students: **What do these numbers have in common?**
6. Pose a reasoning question: **Can there be a group with 27 counters? Why or why not?**



Check and Connect:

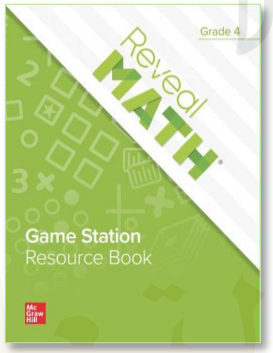
- Ask questions like: **"Are all these numbers even or odd?"** and **"What happens when we try to make a group of 27?"**
- End with a discussion where students share their patterns and **explain why 27 does not fit the rule**.

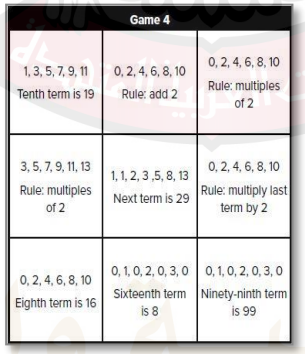
Mastery

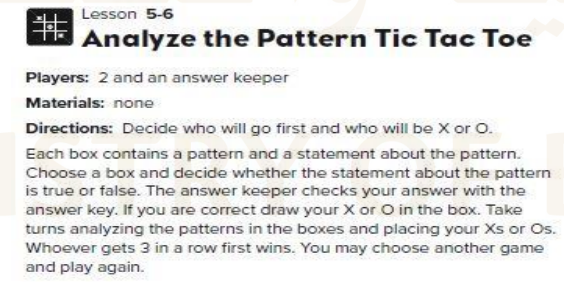
Correctly identify key features of a number or shape pattern and clearly explain the rule or structure that defines the pattern.

Analyse the Pattern Tic Tac Toe (Game Station Activity)

Lesson Reference: Lessons 5-6
Pages: 83 to 85
Source: *Game Station Resource Book*







Beyond Mastery

I can identify, extend, and describe number and shape patterns using both numbers and visuals. I can explain the rule and predict future terms.

Traditional Carpet Tile Pattern

Instructions:

"We're going to start with something exciting! You'll become a carpet designer & create a growing tile **pattern** for a majlis".

1. Design a pattern: Start with 1 row of 5 tiles. Each row after that should follow a pattern rule (e.g., add 3 more tiles each time).
2. Record your pattern:
   - Write the number of tiles in each row (**numerical pattern**).
   - Sketch the carpet tile design (**geometric pattern**).

Example: **Row1** = 5 tiles / **Row 2** = 8 tiles / **Row 3** = 11 tiles

Pattern Rule: **Add 3 tiles each row**.

3. Explain: How do you know it continues that way? Can you **predict how many tiles will be in the 10th row**?

Bonus Challenge:

You are now designing a grand majlis carpet using this rule:
Start with **12 tiles** in the first row.
Each row adds **6 more tiles** than the one before.

- Predict how many tiles would be in the **5th** and **12th row**.
- How many tiles are needed **in total** for the **first 12 rows**?
- **Describe** the rule in words and as a number sentence.

Domain
Operations and Algebraic Thinking

Standards
4.OA.C Generate and analyze patterns.
4.OA.C.5 Create number or shape patterns based on a rule and identify hidden features in the pattern.

SMPs
MP: **5**

Key Vocabulary
- pattern rule
- sequence
- term

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5-6 Analyze Features of a Pattern

Notes / Misconceptions:

- Confusing the pattern rule – for example, thinking a pattern increases by 2 when it actually **alternates between +2 and +3**.
- Mistaking geometric patterns as *random* - students might not recognize **repeated shapes or growth in size/position** as part of a rule.

Resources:

Mastery Level Activity: *Game Station Resource Book* on Reveal platform.

Domain
Operations and Algebraic Thinking

Standards
4.OA.C and **4.OA.C.5**

SMPs
MP: **5**

Key Vocabulary
- pattern rule
- sequence
- term

Basic Numeracy Skills

- Skip counting.
- Fluency with addition and multiplication.
- Numeric and shape patterns from a given rule.

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Multiplication Strategies with Multi-Digit Numbers

Notes & Guidance

Unit 6
In this unit, students will develop strategies to **multiply multi-digit numbers** using *number decomposition*, *area models*, and the *Distributive Property*. They will **compare estimated and actual products** to judge reasonableness. Students will also use **place value** understanding and multiplication by **multiples of 10**. These skills will be applied to solve real-world and multi-step word problems, where students represent problems with equations and find solutions.

Pedagogy

- **Scaffolded Learning:** Provide structured support that gradually fades as students gain confidence and skill.
- **Concrete-Pictorial-Abstract (CPA) Approach:** Build understanding step-by-step using manipulatives, visual models (like area models), and abstract equations.
- **Peer Discussion:** Encourage students to explain their thinking and compare strategies to deepen conceptual understanding.
- **Real-Life Connections**: Use familiar and culturally relevant examples (e.g., UAE markets, palm tree farms) to make learning meaningful.
- **Explicit Instruction:** Clearly model multiplication strategies (e.g., partial products), followed by guided and independent practice.

Key Skills & Learning Goals

- ✓ **Solve multi-step word problems involving multiplication.**
- ✓ **Decompose numbers to simplify multiplication:**

  Example:
  To multiply $42 \times 6 \rightarrow$ Decompose 42 as $(40 + 2)$, then
  $(40 \times 6) + (2 \times 6) = 240 + 12 = 252$

- ✓ **Estimate products to check reasonableness:**

  Example:
  Estimate $47 \times 6 \rightarrow$ Round 47 to $50 \rightarrow 50 \times 6 = 300$
  Then compute the exact answer and compare it to the estimate.

- ✓ **Use the Distributive Property to find partial products.**
- ✓ **Represent real-world problems with multiplication equations.**

International Assessment Links

IEA TIMSS **Whole Numbers** Multiply multi-digit numbers using place value strategies and standard algorithms, estimate products, and solve one- and multi-step word problems involving multiplication.

PISA **Arithmetic Operations** The nature and properties of these operations and related notational conventions.

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Unit 6 – Multiplication Strategies with Multi-Digit Numbers
Learning Objectives & Criteria

Unit Goal:
Multiply multi-digit numbers using decomposition and the Distributive Property.
Practice estimation, multiplying by tens, and solving multi-step word problems.

Learning Objective (LO)	Common Core State Standard	Formative Assessment Criteria
Identify patterns with zeros in products of 1-digit numbers and multiples of 10, 100, and 1,000.	4.NBT.B.5 Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models. 4.OA.A.3 Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. 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.	Identify that the number of zeros in the product matches the number of zeros in the factor and explain this verbally or in writing using reasoning based on place value.
Use estimation strategies such as rounding and compatible numbers to estimate products.		Correctly use a strategy like rounding or compatible numbers to estimate a product and justify why the estimate makes sense in the context of the numbers used.
Use array models and the Distributive Property of Multiplication to multiply two 1-digit factors.		Represent multiplication problems visually and apply the distributive property correctly. Example: Multiply 7 × 4 using an array model and the distributive property.
Use an area model to determine the product of 2-digit and 1-digit factors.		Accurately decompose a multi-digit number into place values, use an area model to find partial products, and correctly sum them. Example: Multiplying 23 × 4 by breaking 23 into 20 and 3, calculating (20 × 4) + (3 × 4) = 80 + 12 = 92
Use an area model to determine the product of a multi-digit factor and a 1-digit factor.		
Identify patterns with zeros in products of two multiples of 10.		Recognize and explain the pattern of zeros when multiplying two multiples of 10. Use the area model to decompose each 2-digit factor, calculate partial products, and sum them to find the correct product.
Use the area model to determine the product of two 2-digit factors.		
Represent and solve multi-step word problems involving multiplication, including equations with a variable.		Translate multi-step word problems into mathematical equations (including variables), apply correct multiplication steps, and clearly justify the solution process to find the correct answer.

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6-1 Multiply by Multiples of 10, 100, or 1,000

Learning Objectives

Students should be able to:

- Identify patterns with zeros in products of 1-digit numbers and multiples of 10, 100, and 1,000.

Towards Mastery

Multiply numbers that end in zeros and use base-ten blocks to help them understand how the zeros affect the answer.

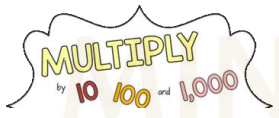
Multiple Times

Preparation Steps:

- Prepare index cards with numbers that are multiples of 100 and 1,000 (e.g., 100, 200, 1,000, 3,000).
- Provide each group with a set of base-ten blocks, a number cube (dice) and a recording sheet.

Instructions:

1. Draw and roll: Divide students into small groups of 3-4.
   - The first student in each group draws a card (**a multiple of 100 or 1,000**) and rolls the number cube (1–6).
2. Multiply: Students **multiply the two numbers**—using the card and the cube result as *factors*.
3. Model with Base-Ten Blocks: Using base-ten blocks, they model the multiplication. For example, if the card says 200 and the dice shows 3, they model **3 groups of 200**.
4. Record the Equation: They write the **equation** (e.g., $200 \times 3 = 600$) and discuss the **pattern** in the **number of zeros**.



Check and Connect:

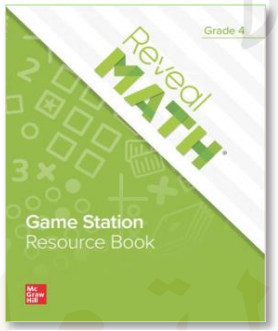
➢ Ask: "What happens to the product when you multiply by a number with **one or more zeros** at the **end**?" and "Can you describe a **shortcut** for **multiplying** numbers like 300×4?"

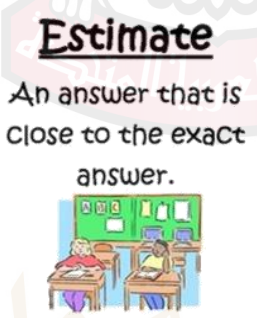
Mastery

Accurately identify and explain patterns with zeros in products of 1-digit numbers and multiples of 10, 100, and 1,000.

Multiples of 10, 100 and 1000 Race (Game Station Activity)

Lesson Reference: Lessons 6-1 and 6-6
Pages: 86 to 88
Source: *Game Station Resource Book*





Lesson 6-1 and 6-6
Multiples of 10, 100, and 1,000 Race

Players: 2 or more and an answer keeper
Materials: Small game pieces like counters
Directions: Each player picks a card. The player with the greatest number goes first.

When it is your turn, pick a card and move your game piece the number of spaces on the card. If you land on a space with an equation, solve the equation. The answer keeper checks your answer with the answer key. If you are correct, stay on that space. If not, go back one space. If you land on a space with directions, follow them. Now it is the next player's turn. You must have the exact number to get to Finish.

Beyond Mastery

Students will fluently multiply whole numbers by multiples of 10, 100, and 1000 using place value understanding and strategies based on patterns and reasoning.

Palm Tree Plantation Planner

Instructions:

1. Prepare task cards with multiplication problems involving multiples of 10, 100, and 1000 (e.g., 30×100, 40×200).
2. Warm-Up Question: If 1 row in a palm plantation has 50 trees, how many trees are in **2 rows**, **10 rows** and **100 rows**?
3. Planning the Plantation: Divide students into pairs or small groups. Give each group a "Farm Plan Card" such as:
   - "You are planting 200 rows, each with 40 trees."
   - "You are planning 1,000 rows, each with 60 trees."
4. Challenge them: Multiply the numbers **mentally** and **explain** how they used the pattern of zeros in their solution.



Bonus Challenge:
A mega plantation in Liwa has **2,000 rows** of date palms, with **120 trees in each row**. How many trees are there in ***total***?

✓ Encourage students to break this into parts:

$$2{,}000 \times 120 = (2{,}000 \times 100) + (2{,}000 \times 20)$$

$$= 200{,}000 + 40{,}000 = 240{,}000 \text{ trees}$$

Domain
Number and Operations in Base Ten

Standards
4.NBT.B and **4.NBT.B.5**
Multiply multi-digit numbers using place value, properties of operations, and models like arrays or equations.

SMPs
MP: **2**

Key Vocabulary
- Associative property of multiplication
- multiple(s)

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6-1 Multiply by Multiples of 10, 100, or 1,000 (cont'd)

Notes / Misconceptions:

❖ Students might incorrectly **count or place zeros** in the answer (e.g., $5 \times 1{,}000 = 50{,}000$ instead of 5,000).

Resources:

Mastery Level Activity: *Game Station Resource Book* on Reveal platform.

Domain
Number and Operations in Base Ten

Standards
4.NBT.B and **4.NBT.B.5**

SMPs
MP: **2**

Key Vocabulary
- Associative property of multiplication
- multiple(s)

Basic Numeracy Skills

- Basic multiplication facts.
- Generate and identify patterns.
- Understanding of place value.

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6-2 Estimate Products

Learning Objectives

Students should be able to:

- Use estimation strategies such as rounding and compatible numbers to estimate products.



Towards Mastery

Students will estimate the product of two numbers by rounding to the nearest ten or hundred.

About How Much?

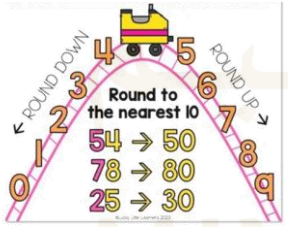
Preparation Steps:

- Prepare 4 number cubes per group (3 for generating a 3-digit number and 1 for the 1-digit number).
- Form small groups of 3–4 students.

Instructions:

1. Each group rolls **3 number cubes** to create a **3-digit factor**. Then, roll **1 additional cube** to get a **1-digit factor**.
2. Write the **multiplication expression** using both factors.
3. Each student **estimates the product** using either *rounding* or *compatible numbers*.
4. Ask them to write and **explain how they estimated** (e.g., "I rounded 347 to 350, then multiplied by 6"). And, whether **two different estimates** could both be reasonable.





Check and Connect:

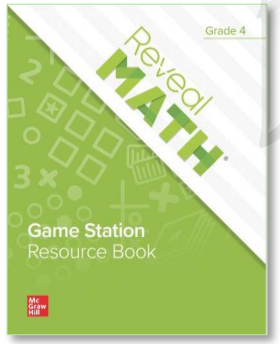
- Ask guiding questions: "**Why** did you round that number the way you did?" and "Could someone else have **rounded differently** and **still be reasonable**?"
- Ensure students **justify their choices** and **compare strategies**.

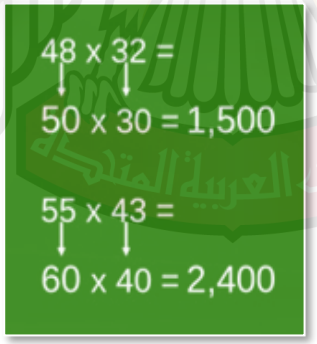
Mastery

Accurately estimate products by using strategies like rounding or compatible numbers and explain why the estimate is reasonable.

Estimation Race (Game Station Activity)

Lesson Reference: Lesson 6-2
Pages: 89 to 92
Source: *Game Station Resource Book*





Lesson 6-2
Estimation Race

Players: 2 or more and an answer keeper

Materials: Small game pieces like counters

Directions: Decides who goes first.

When it is your turn, pick a card. Use the Hint to estimate the product on your card. The answer keeper checks your answer with the answer key. If you are correct, move your game piece the number of spaces shown on the card. If not, move back 1 space. Now it is the next player's turn. The player who reaches the Finish line first wins the game.

Beyond Mastery

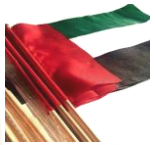
Students will apply rounding and estimation strategies to efficiently estimate products in real-life scenarios.

Estimating Souk Sales

Instructions:

1. Create *Souk Item Cards* with 3-digit quantities and 1-digit prices (e.g., **274 oud sticks at 5 AED each**).
2. In pairs, students pick an item card (e.g., "You have **386 grams** of saffron, **each gram sells for 7 AED**").
3. **Round one or both numbers** (e.g., 386 ≈ 400, 7 as is).
4. Estimate the total price: $400 \times 7 = 2800$ *AED.*
5. Students record the **original numbers**, their **estimation method** and the **estimated total**.
6. Ask them: Would it be helpful to round **both numbers**? Why or why not?





Bonus Challenge:

You're preparing a special order for **UAE National Day** at your souk stall. You need to estimate your *total earnings* from three best-selling items.

Your bulk order includes: **384 mini flags**, each sold at **9 AED**, **276 bracelets**, each sold at **4 AED** and **439 scarves**, each sold at **6 AED.**

Estimate the *total earnings* from each item using **rounding or compatible numbers**. Then, find the **combined estimated total** for the entire order.

Domain
Number and Operations in Base Ten

Standards
4.NBT.B and **4.NBT.B.5**
Multiply multi-digit numbers using place value, properties of operations, and models like arrays or equations.

SMPs
MP: **2**

Key Vocabulary
- compatible numbers
- rounding
- *accurate*
- *method*

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6-2 Estimate Products (cont'd)

Notes / Misconceptions:

- Rounding incorrectly - Students might apply the **rounding rules** *incorrectly*, such as rounding 47 down to 40 rather than up to 50, leading to estimation errors.
- Forgetting place value - When **rounding and multiplying**, students might not account for **place value correctly**, leading to major errors (e.g., 60 × 30 being miscalculated as 180 instead of 1,800).
- The last 2 key vocab words (*accurate* and *method*) in purple are **academic terms**–it's helpful to support students in understanding and using them correctly.

Resources:

Mastery Level Activity: *Game Station Resource Book* on Reveal platform.

Domain
Number and Operations in Base Ten

Standards
4.NBT.B and **4.NBT.B.5**

SMPs
MP: **2**

Key Vocabulary
- compatible numbers
- rounding
- *accurate*
- *method*

Basic Numeracy Skills

- Estimation strategies including rounding.
- Fluency with multiplication.

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6-3 Use the Distributive Property to Multiply

Learning Objectives

Students should be able to:

- Use array models and the Distributive Property of Multiplication to multiply two 1-digit factors.

Towards Mastery

Students will break apart numbers to solve multiplication problems using the Distributive Property.

Distribute the Factor

Preparation Steps:

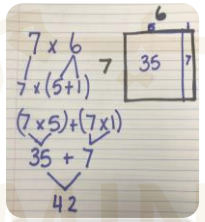
- Prepare Index cards with **single-digit multiplication expressions** (e.g., 6×7, 8×5, 9×4).
- Pair up students and give each pair a multiplication expression on a card (e.g., 6×7).

Instructions:

1. Decompose a Factor: Ask students to break apart one factor (e.g., decompose 6 into $3 + 3$) and rewrite the expression using the **Distributive Property**:

$$6 \times 7 = (3 + 3) \times 7 = (3 \times 7) + (3 \times 7)$$

2. Draw Arrays: Have students represent their breakdown using **rectangular arrays** or area models on graph paper.
3. Students exchange their papers with another pair, check the *decomposed expression* & solve to **verify accuracy**.
4. Highlight that there is often **more than one correct way** to decompose a number (e.g., $6 = 2 + 4$ *or* $1 + 5$).



Check and Connect:

- Ask: "Why did you choose to **break 6 into 3 + 3**?" and "Can you find **another way to decompose it**?"
- Connect: **How** does this help you **understand multiplication better?**

Mastery

Correctly use an array model and the Distributive Property to multiply two 1-digit numbers and clearly explain the strategy.

Distributive Property Concentration (Game Station Activity)

Lesson Reference: Lesson 6-3
Pages: 93 to 96
Source: *Game Station Resource Book*



Lesson 6-3
Distributive Property Concentration

Players: 2 or more and an answer keeper

Materials: none

Directions: Place the cards face down in a "Multiplication" group and a "Distributive Property" group.

When it is your turn, flip over one card from each group looking for matching cards. Tell the answer keeper if you have a match. The answer keeper checks the answer key to see if you are correct. 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.

Whoever has the most cards at the end of the game wins.

Beyond Mastery

I can apply the Distributive Property to break apart and multiply 2-digit with 1-digit numbers and explain different strategies for efficient problem-solving.

Traditional Lanterns for Ramadan Nights

Story Setup:

As Ramadan approaches, you're helping design lanterns. Each lantern has small sections that repeat. Use the **Distributive Property** to find out total number of pieces needed.

Instructions:

1. Prepare sets of number cards with **2-digit numbers** (e.g., 64, 75, 82) and **multiplication cards with single-digit** multipliers (e.g., 3, 4, 5, 6).
2. Provide sentence frames for explanations (e.g., "I broke ___ into ___ and ___ because…").
3. Each pair of students draws a **2-digit lantern card** (e.g., 64) and a **multiplier card** (e.g., 6 houses).
4. Students solve, then illustrate using an array drawing:

$$6 \times 64 = 6 \times (60 + 4) = (6 \times 60) + (6 \times 4)$$
$$= 360 + 24 = 384 \text{ lanterns}$$





Bonus Challenge:

A celebration tent is set up in **9 towns**. Each town has **86 lanterns** ready for Ramadan night. **How many lanterns are needed *in total*?**

✓ Encourage students to **break** this into parts:

$$9 \times (80 + 6) = (9 \times 80) + (9 \times 6) = 720 + 54 = 774 \text{ lanterns}$$

Domain
Number and Operations in Base Ten

Standards
4.NBT.B and **4.NBT.B.5**
Multiply multi-digit numbers using place value, properties of operations, and models like arrays or equations.

SMPs
MPs: **5** and **7**

Key Vocabulary
- decompose
- Distributive property
- factor
- product

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6-3 Use the Distributive Property to Multiply (cont'd)

Notes / Misconceptions:

- Students may break one factor correctly but **forget to multiply both parts** by the second factor.
- **Confusion between operations** - Students may mistakenly combine addition and multiplication *incorrectly*, such as interpreting $(3 + 2) \times 4$ as $(3 \times 4) + 2$ instead of distributing properly as $(3 \times 4) + (2 \times 4)$.

Resources:

Mastery Level Activity: *Game Station Resource Book* on Reveal platform.

Domain
Number and Operations in Base Ten

Standards
4.NBT.B and **4.NBT.B.5**

SMPs
MPs: **5** and **7**

Key Vocabulary
- decompose
- Distributive property
- factor
- product

Basic Numeracy Skills

- Fluency with multiplication.
- Understanding of place value & number decomposition.

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6-4 Multiply 2-Digit by 1-Digit Factors

Learning Objectives

Students should be able to:

- Use an area model to determine the product of 2-digit and 1-digit factors.

Towards Mastery

Use the Distributive Property to break apart a two-digit factor.

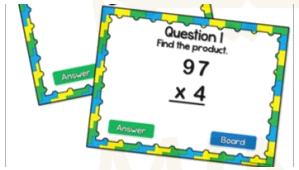
Give Me a Break!

Preparation Steps:

- Prepare Index cards labeled with the numbers **3 to 5** and color tiles or counters.
- Prepare numbers **11 to 15** on separate slips for random selection and put students **in pairs**.

Instructions:

1. Draw Numbers: One student draws a card (3 to 5), then choose or roll a number between 11 to 15.
2. Build the Array: Use **color tiles** to model an array with **rows = card number** and **columns = number chosen**.
3. Help students **break apart** the two-digit number (e.g., $13 = 10 + 3$). Then, build **two smaller arrays** that represent the parts of the decomposition.
4. Find Partial Products: Count the tiles in each part of the array. Write two multiplication sentences (e.g., 4×10 and 4×3). Then, add the partial products to find **total** product.



Check and Connect:

- Ask: "How did breaking the number apart help you?" and "Can we **check our answer** another way?"
- Connect: What do you notice about how the **numbers relate to the tiles?**

Mastery

Accurately use an area model to break apart a 2-digit number, multiply by a 1-digit factor, and combine partial products to find the total.

Multiplying Numbers Task Cards (Game Station Activity)

Lesson Reference: Lesson 6-4
Pages: 97 to 99
Source: *Game Station Resource Book*



Beyond Mastery

Students will apply multiplication of 2-digit by 1-digit numbers using real-life scenarios, demonstrating reasoning, accuracy, and efficiency.

Gahwa Pot Souvenir Stand

Story Setup:

You're helping at a booth during the UAE Heritage Festival, where tourists can buy traditional **coffee (gahwa) pot souvenirs.** Each pot costs **AED 42** and it's your job to calculate their total purchase costs quickly and accurately.

Instructions:

1. Calculate the **total cost** for the following bulk orders:
   - Ahmed buys **3 gahwa pots**. What is the **total cost**?
   - Fatima wants to buy **5 pots** as gifts for her relatives. **How much will she pay?**
   - Aisha is buying **7 pots** for her wedding giveaways. What is her **total cost**?
   - Rashid decides to buy **9 pots**. How much will it **cost** him?
2. Choose at least one of the problems above and solve it using **two different multiplication strategies** (for example: distributive property, area model, or repeated addition). Then, write a short explanation about which strategy you preferred and why.

Bonus Challenge – Be the Business Owner:

- You have a budget of **AED 500** to buy gahwa pot souvenirs to resell at your booth. How many pots can you afford to buy **without exceeding your budget**?
- If you sell **8 pots in one day**, how much money will you earn **in total?**

Domain
Number and Operations in Base Ten

Standards
4.NBT.B and **4.NBT.B.5**
Multiply multi-digit numbers using place value, properties of operations, and models like arrays or equations.

SMPs
MPs: **1** and **4**

Key Vocabulary
- area model
- Distributive property
- partial products



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6-4 Multiply 2-Digit by 1-Digit Factors (cont'd)

Notes / Misconceptions:

- Students may treat each digit in the 2-digit number as a **single unit** without **considering place value**. Example: thinking 24 × 3 is the same as 2 × 3 + 4 × 3 instead of correctly applying (20 × 3) + (4 × 3).
- Students forget to **distribute the single-digit factor** to **both parts** of the *2-digit number*.

Resources:

Mastery Level Activity: *Game Station Resource Book* on Reveal platform.

Domain
Number and Operations in Base Ten

Standards
4.NBT.B and **4.NBT.B.5**

SMPs
MPs: **1** and **4**

Key Vocabulary
- area model
- Distributive property
- partial products

Basic Numeracy Skills

- Fluency in multiplication facts within 100.
- Understanding of number decomposition.

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6-5 Multiply Multi-Digit by 1-Digit Factors

Learning Objectives
Students should be able to:

- Use an area model to determine the product of a multi-digit factor and a 1-digit factor.

Towards Mastery

Students will multiply a 2-digit number by a 1-digit number using partial products and the Distributive Property.

On a Roll

Preparation Steps:

- Prepare sets of **3 number cubes (dice)** for each group, divide students into groups of **three**.

Instructions:

1. Rolling Numbers: Each group rolls **two dice** to form a **2-digit number** and **one die** to get a **1-digit multiplier**.
2. Solving:

- One student *multiplies* the 2-digit number by the 1-digit number using **partial products** or the **Distributive Property** (e.g., 46 × 3 → (40 × 3) + (6 × 3)).
- The second student solves it mentally or with another strategy to **verify the result**.
- The third student **explains the reasoning** behind the method used and checks for accuracy.

3. Once they show comfort with 2-digit numbers, roll **3 dice to form a 3-digit number** and repeat the process.



Check and Connect:

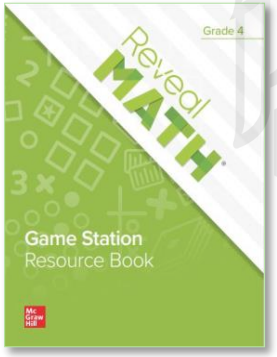
- Ask: **"**Which part of the equation represents **the tens**?"
- Connect: How can you **check your answer** using *a different* strategy?

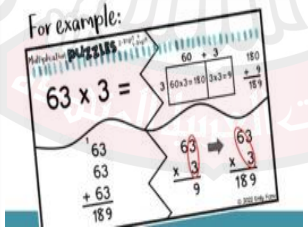
Mastery

Correctly apply an area model to break apart a multi-digit number, multiply each part by a 1-digit factor & combine partial products to find the total.

Multiplication Concentration (Game Station Activity)

Lesson Reference: Lesson 6-5
Pages: 100 to 103
Source: *Game Station Resource Book*





Lesson 6-5
Multiplication Concentration

Players: 2 or more and an answer keeper

Materials: none

Directions: Turn the cards face down in a "Problem" group, a "Partial Products" group, and a "Products" group.

When it is your turn, flip over one card from each group looking for matching cards. Tell the answer keeper if you have a match. The answer keeper checks the answer key to see if you are correct. If they match, you keep the 3 cards. If there is no match, turn the cards face down again. Now it is the next player's turn.

Whoever has the most cards at the end of the game wins.

Beyond Mastery

Accurately solve multi-digit by 1-digit multiplication problems using place value and explain their reasoning.

Arabian Horse Stable Management Challenge

Story Hook:

"Imagine you are the stable manager of a famous Arabian horse farm in the UAE. Your job is to prepare supplies for each stable, and you must calculate large amounts correctly!"

Instructions:

1. Pose a mental math question: "If **each stable** has **6 horses**, and **each horse eats 3 hay bales per day**, how many hay bales do you need in ***total***?"
2. Give students challenge cards like:

- Stable A has **248 sacks of oats**. There are ***4 identical stables***. How many sacks are there **in total**?
- Each horse uses **135 liters of water** per week. There are **7 horses.** How many liters are needed for **the week**?
- Each stable needs **326 grooming tools**.

There are **3 stables**.

How many tools are needed **in total**?



Bonus Challenge:
You've just received a delivery for **9 stables**. **Each stable contains 432 saddles**. How many saddles are in total?

✓ Encourage students to:

Use 2 different methods (area model & distributive property).

Explain which method felt faster or clearer.

Domain
Number and Operations in Base Ten

Standards
4.NBT.B and **4.NBT.B.5**
Multiply multi-digit numbers using place value, properties of operations, and models like arrays or equations.

SMPs
MPs: **4** and **5**

Key Vocabulary
- area model
- Distributive property
- partial products

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6-5 Multiply Multi-Digit by 1-Digit Factors (cont'd)

Notes / Misconceptions:

- Students may multiply a digit by an **incorrect place value**.
- Students might **misalign digits** during multi-step calculations, especially when writing products in **vertical form**, leading to *incorrect addition*.
- **Carrying (Regrouping) Errors** - During *standard algorithm multiplication*, students may **carry the wrong digit** or add the regrouped number to the **wrong place value**.

Resources:

Mastery Level Activity: *Game Station Resource Book* on Reveal platform.

Domain
Number and Operations in Base Ten

Standards
4.NBT.B and **4.NBT.B.5**

SMPs
MPs: **4** and **5**

Key Vocabulary
- area model
- Distributive property
- partial products

Basic Numeracy Skills

- Decomposing factors to multiply.
- Using partial products to multiply.

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6-6 Multiply Two Multiples of 10

Learning Objectives

Students should be able to:

- Identify patterns with zeros in products of two multiples of 10.

Towards Mastery

Students will multiply two-digit multiples of 10.

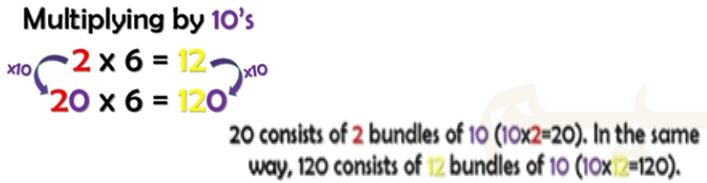
How Much?

Preparation Steps:

- Prepare number cubes (2 per group) and divide students into **small groups** (2-3 per group).

Instructions:

1. Rolling Numbers: Each group rolls **two number cubes.** For example, if they **roll a 3 and a 6**, they *multiply* each result by **10**, resulting in **30 and 60**.
2. Forming Expressions: Students write a **multiplication expression** using the results (e.g., 30×60).
3. Have students solve the expression. They may first solve $3 \times 6 = 18$, then *adjust* for the multiples of **10 to get 1800**.
4. Ask students: "How is 30×60 related to 3×6 ?" Encourage them to explain how the **zeros impact** the product and **why**.



Check and Connect:

- Ask: "What would happen if you multiplied 40×20 instead?" and "How do the zeros help you?"
- Student Self-Check: Can you find the *basic fact first* (4×2), and then **adjust the answer for the tens**?

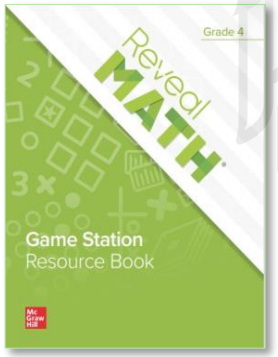
Extension: Can you *predict* the product of 50×70 **without doing the full calculation first**?

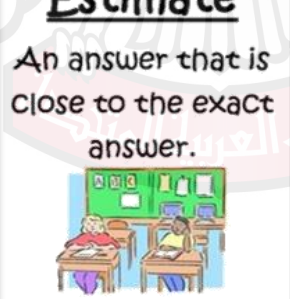
Mastery

Accurately identify and explain the pattern with zeros in the product of two multiples of 10.

Multiples of 10, 100 and 1000 Race (Game Station Activity)

Lesson Reference: Lessons 6-1 and 6-6
Pages: 86 to 88
Source: *Game Station Resource Book*





Lesson 6-1 and 6-6
Multiples of 10, 100, and 1,000 Race

Players: 2 or more and an answer keeper

Materials: Small game pieces like counters

Directions: Each player picks a card. The player with the greatest number goes first.

When it is your turn, pick a card and move your game piece the number of spaces on the card. If you land on a space with an equation, solve the equation. The answer keeper checks your answer with the answer key. If you are correct, stay on that space. If not, go back one space. If you land on a space with directions, follow them. Now it is the next player's turn. You must have the exact number to get to Finish.

Beyond Mastery

Students will multiply two-digit multiples of 10 to solve multi-step problems, applying reasoning in culturally relevant contexts.

Market Day at the Date Festival

Instructions:

1. Prepare pre-made **"price cards"** (e.g., 20 AED, 30 AED, 70 AED) and **"quantity cards"** (e.g., 40 boxes, 60 boxes).
2. In pairs or small groups, students draw **one price card** and **one quantity card**. These are both **multiples of 10**.
3. Multiply the two numbers to find the total cost. Example: If a box of dates **costs 50 AED** and someone **buys 60 boxes**, students calculate 50×60.
4. Students explain the strategy — e.g., "We **multiplied 5 × 6 to get 30**, then **added two zeros** to make **3,000 AED**."



Bonus Challenge – The Royal Order:

A member of the **Royal Family** visits a Date Festival and places a large order of dates. They request **3 different combinations** of *price and quantity* that result in the **same total cost**.

- Find **three different multiplication expressions** using **multiples of 10** (e.g., 20, 30, 40…) that all give the **same product** (total cost), and show your calculations.
- **Explain** how each combination is **equivalent** and how you used *multiplication strategies* to find them.

Example Solution: If the **target product** is **3,000 AED**, students could give: 50×60 , 30×100 and 20×150.

Domain
Number and Operations in Base Ten

Standards
4.NBT.B and **4.NBT.B.5**
Multiply multi-digit numbers using place value, properties of operations, and models like arrays or equations.

SMPs
MP: **7**

Key Vocabulary
- Associative property of multiplication
- multiple
- *examine*

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6-6 Multiply Two Multiples of 10 (cont'd)

Notes / Misconceptions:

- Students may write the **incorrect number of zeros** when **multiplying by multiples of 10**.
- Students may overlook the basic fact (2 × 3) and focus **only on the zeros**. Example: writing 2 zeros without calculating the **base multiplication first.**
- The last key vocab word (*examine*) in purple is an **academic term**–it's helpful to support students in understanding and using it correctly.

Resources:

Mastery Level Activity: *Game Station Resource Book* on Reveal platform.

Domain
Number and Operations in Base Ten

Standards
4.NBT.B and **4.NBT.B.5**

SMPs
MP: **7**

Key Vocabulary
- Associative property of multiplication
- multiple
- *examine*

Basic Numeracy Skills

- Decomposing numbers to multiply.
- Using the Distributive Property.

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6-7 Multiply Two 2-Digit Factors

Learning Objectives

Students should be able to:

- Use the area model to determine the product of two 2-digit factors.

Towards Mastery

Practice multiplying a 2-digit number by a 2-digit number .

Roll It, Solve It!

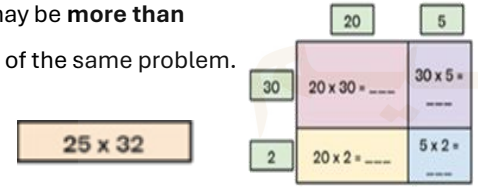
Preparation Steps:

- Provide each student **pair** with a **number cube** (dice) and a **multiplication facts** table/chart.

Instructions:

1. Roll & Build: One student rolls the number cube *twice* to create a **2-digit number** (e.g., rolls 3 and 6 → number is 36). Then, the partner *confirms the number*.
2. **Multiply** the 2-digit number by another 2-digit number. Use **partial products** or the **Distributive Property** to **break down** the multiplication (e.g., 36 × 15 = (36 × 10) + (36 × 5)).
3. Students **explain** the strategy they used. Partners *compare answers* and strategies and **discuss any errors**.
4. Students check each other's work using the multiplication chart or by re-solving.

Reinforce that there may be **more than one valid breakdown** of the same problem.



Check and Connect:

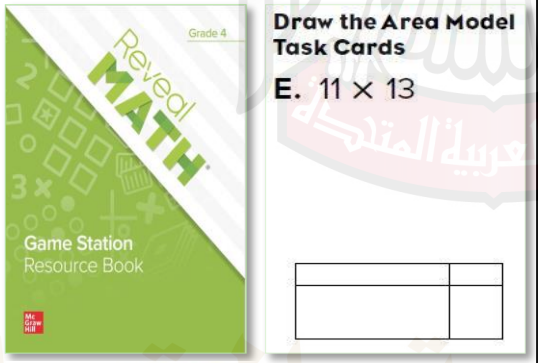
- Ask: **"**How did **breaking apart** the number help you solve the problem?" and "Could you have used a *different combination* to **break down 15**?"
- Connect: What do you notice about the *relationship* between 36 × 10 and 36 × 5?

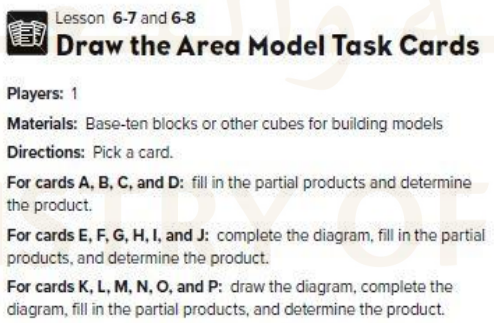
Mastery

Use an area model to multiply two 2-digit numbers by breaking them into parts, finding partial products, and combining them to find the total.

Draw the Area Model Task Cards (Game Station Activity)

Lesson Reference: Lessons 6-7 and 6-8
Pages: 104 to 108
Source: *Game Station Resource Book*





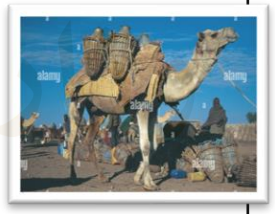
Beyond Mastery

Students will multiply two 2-digit numbers to solve real-world problems with accuracy and explain their strategies.

Camel Caravan Travel

Instructions:

1. Pose the Challenge: There are **26 camels** in the caravan. Each camel is carrying **34 liters of water** in containers. How many liters of water is the entire caravan carrying?
2. Students use an **area model**, **partial products**, or **standard algorithm** to solve 25 × 34. Encourage students to write an **explanation** of their method.
3. Pair up students to compare strategies and **explain their reasoning**. Ask: Did both of you get the same product? *If not,* ***what step may have been different?***
4. Check and Connect: Review strategies with the class. Connect the math to real-world survival in the desert: *Is this enough water for **2 days**? How many **liters would be needed for 5 more camels?***
5. Assessment Prompt: Can they clearly **explain how they arrived at their answer?**



Bonus Challenge:

The caravan gets **15 more camels**, and each new camel carries **42 liters** of water. How many liters are **added to the total water carried** by the caravan?

- Add this to the **original total**. What is the **new total volume of water carried?**

Domain
Number and Operations in Base Ten

Standards
4.NBT.B and **4.NBT.B.5**
Multiply multi-digit numbers using place value, properties of operations, and models like arrays or equations.

SMPs
MPs: **2** and **7**

Key Vocabulary
- area model
- Distributive property
- partial products

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6-7 Multiply Two 2-Digit Factors (cont'd)

Notes / Misconceptions:

- Students may **incorrectly line up digits** when using the area model or partial products, leading to calculation errors.
  Example: Adding 30 × 4 under 20 × 4 without aligning **tens correctly.**
- Students may multiply correctly but forget to **combine all parts at the end**.
- Students may forget to **add the zero in the second row** or when solving a *multiplication* problem.

Resources:

Mastery Level Activity: *Game Station Resource Book* on Reveal platform.

Domain
Number and Operations in Base Ten

Standards
4.NBT.B and **4.NBT.B.5**

SMPs
MPs: **2** and **7**

Key Vocabulary
- area model
- Distributive property
- partial products

Basic Numeracy Skills

- Fluency with multiplication.
- Area models and partial products.

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6-8 Solve Multi-Step Problems Involving Multiplication

Learning Objectives

Students should be able to:

- Represent and solve multi-step word problems involving multiplication, including equations with a variable.

Towards Mastery

Students will solve multi-step multiplication word problems using area models and equations.

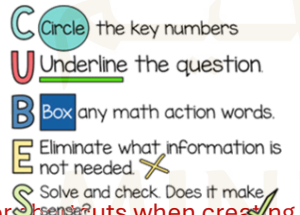
Matching

Preparation Steps:

- Create multi-step **multiplication word problems** (e.g., "A bakery makes **15 cakes a day**. Each cake is cut into **12 slices**. If they sell all the cakes in **3 days**, how many slices do they sell?").
- Gather paper, pencils and pair students.

Instructions:

1. Students **work in pairs** to solve problems, using **area models** and **equations**. Give each pair a word problem.
2. Model and Equation:
   - Student A: Draw an area model.
   - Student B: Write matching equation(s).
3. Discuss and Solve: Partners discuss the model and equations, then solve.
4. Switch roles after each problem.
5. Repeat with new problems.



Check and Connect:

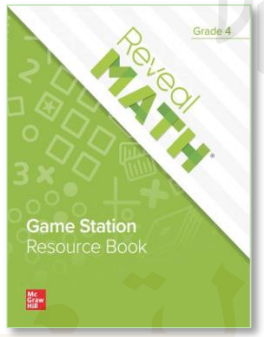
- Ask: **"Did you notice any patterns** or shortcuts when creating the area models or writing the equations?" and "How did you **check your answers** to make sure they were correct?"
- Connect: What did you **learn about multiplication** and **multi-step problems** from this activity?

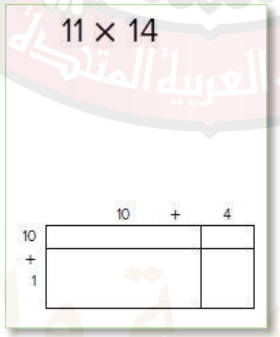
Mastery

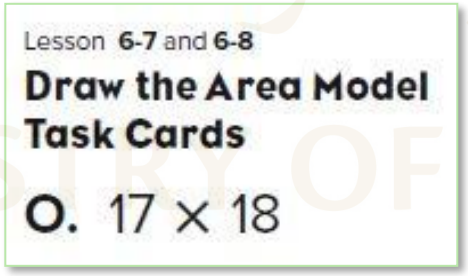
Accurately represent and solve multi-step multiplication word problems using equations with a variable.

Draw the Area Model Task Cards (Game Station Activity)

Lesson Reference: Lessons 6-7 and 6-8
Pages: 104 to 108
Source: *Game Station Resource Book*







Beyond Mastery

Students will solve multi-step word problems involving multiplication and logical reasoning in real-life contexts, demonstrating fluency and accuracy.

Desert Camp Supply Planning

Scenario:

Imagine you are part of a team organizing a **traditional desert camp** for families visiting Liwa during the winter festival. Each family at the camp needs: **3 meals per day**, **for 4 days**, and there are **18 families attending**.

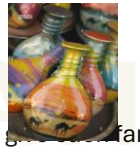
Step 1: How many meals does **one family need in total**?

Step 2: How many meals are **needed for all 18 families**?

Follow-up Question: Each meal includes **2 water bottles**. How many water bottles are **needed for the whole camp**?

Instructions:

1. Work in pairs or small groups.
2. Solve the problem **step-by-step** using *multiplication* and **reasoning**. Show your work clearly and **explain your reasoning** in *writing* or *orally*.
3. **Draw** a simple chart/picture to **visualize** the quantities.





Bonus Challenge:

The camp organizers want to g[illegible] family a souvenir bag with **6 items inside**. How many items do they need **in total**?

- Now suppose they want to pack those items into **boxes of 24. How many boxes will they need?**

Domain
Operations and Algebraic Thinking

Standards
4.OA.A.3 Solve multi-step word problems with whole numbers using all operations. Represent unknowns with letters, interpret remainders, and check answers using mental math and estimation.

SMPs
MP: **3**

Key Vocabulary
- variable
- *check*

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6-8 Solve Multi-Step Problems Involving Multiplication (cont'd)

Notes / Misconceptions:

- Incorrect **Order of Operations** in Word Problems - Students may perform operations in the *wrong order*, leading to incorrect answers in multi-step problems.
- The last key vocab word (*check*) in purple is an **academic term**—it's helpful to support students in understanding and using it correctly.

Resources:

Mastery Level Activity: *Game Station Resource Book* on Reveal platform.

Domain
Operations and Algebraic Thinking

Standards
4.OA.A.3

SMPs
MP: 3

Key Vocabulary
- variable
- *check*

Basic Numeracy Skills

- Two-step word problems.
- The Distributive Property

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MINISTRY OF EDUCATION

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