# Mathematics Curriculum

## Comprehensive Curriculum Guide

Grade 4 General Reveal

Term 2

2025-2026

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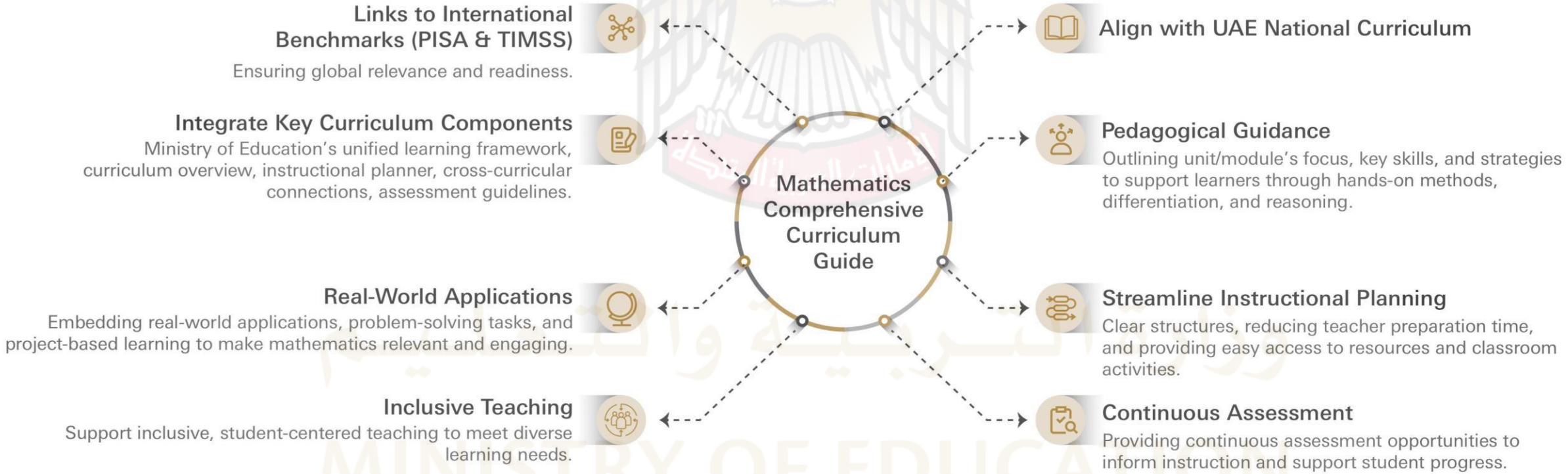
# CCG Overview

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.



# Overview of EMTPs and SMPs

1 Promotes meaningful understanding over rote memorization.

**Conceptual Understanding**

2 Empowers students to take ownership of their learning.

**Student Empowerment**

3 Ensures inclusive and culturally responsive mathematics education.

**Equity and Access**

**EMTPs Enhance Quality Teaching Practice**

**SMPs Enhance Students' Learning Expertise**

**Conceptual Understanding**

Promotes deeper understanding of math concepts

**Critical Thinking**

Encourages students to analyze and evaluate

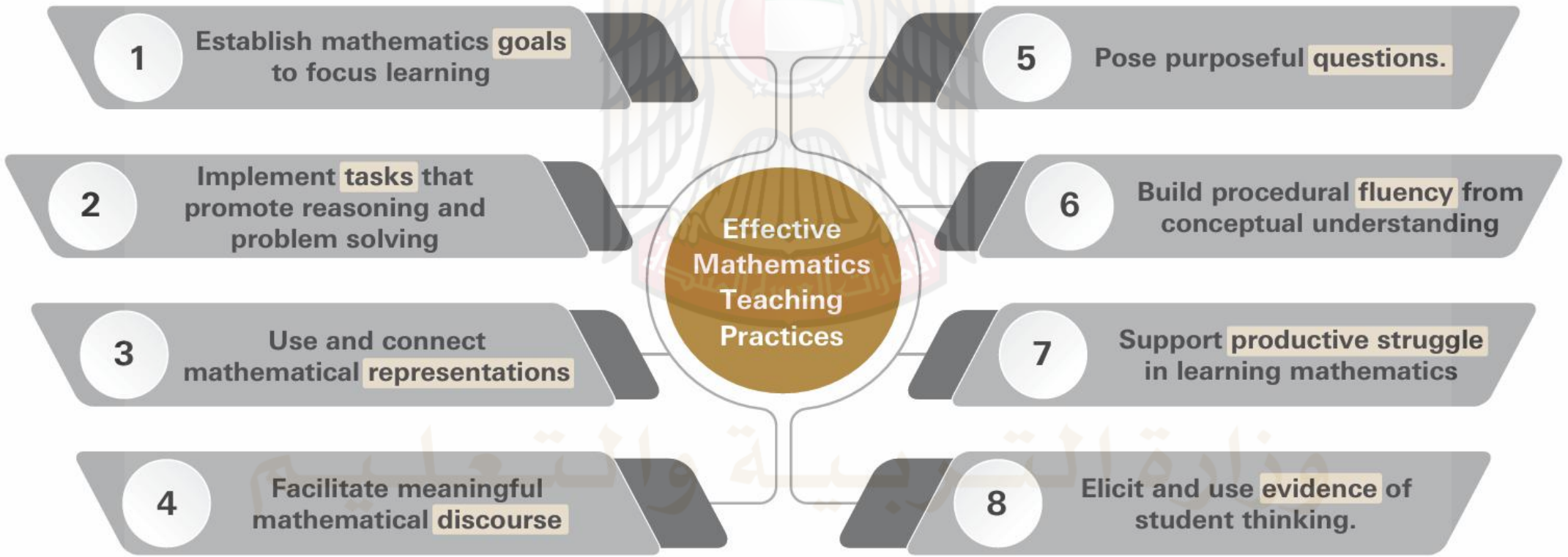
**Collaboration**

Fosters teamwork and communication skills

**Real-World Application**

Connects math to practical scenarios

# 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.*

# 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. |

# 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 |

# 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 |

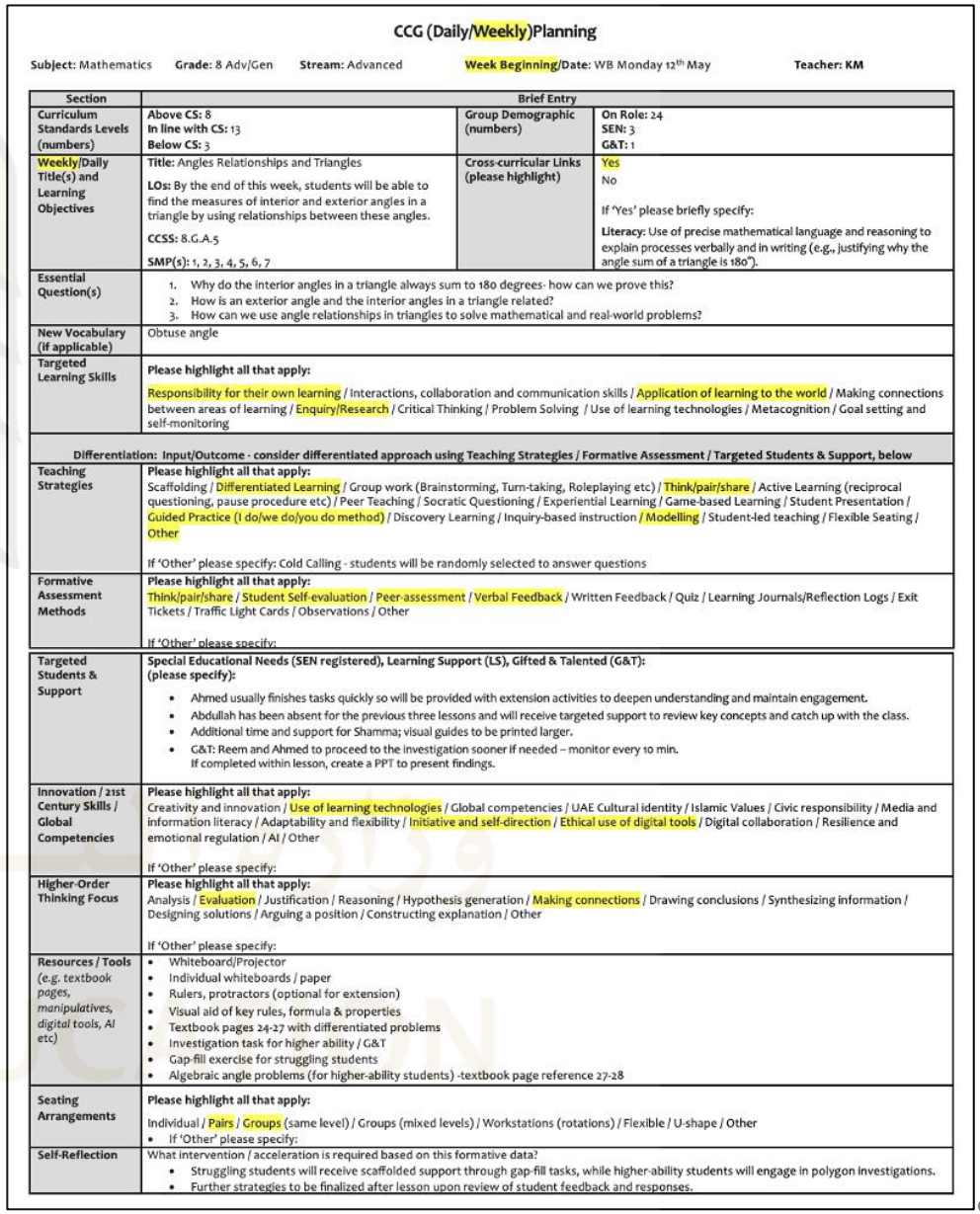
Whether we are assessing knowledge, understanding or skills affects the language we are using, particularly the verbs we choose.

# 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<br>**In line with CS:** 13<br>**Below CS:** 3 | **Group Demographic (numbers)** | **On Role:** 24<br>**SEN:** 3<br>**G&T:** 1 |
| **Weekly/Daily Title(s) and Learning Objectives** | **Title:** Angles Relationships and Triangles<br>**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.<br>**CCSS:** 8.G.A.5<br>**SMP(s):** 1, 2, 3, 4, 5, 6, 7 | **Cross-curricular Links (please highlight)** | Yes<br>No<br>If 'Yes' please briefly specify:<br>**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?<br>2. How is an exterior angle and the interior angles in a triangle related?<br>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:**<br>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:**<br>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<br>If 'Other' please specify: Cold Calling - students will be randomly selected to answer questions | | |
| **Formative Assessment Methods** | **Please highlight all that apply:**<br>Think/pair/share / Student Self-evaluation / Peer-assessment / Verbal Feedback / Written Feedback / Quiz / Learning Journals/Reflection Logs / Exit Tickets / Traffic Light Cards / Observations / Other<br>If 'Other' please specify: | | |
| **Targeted Students & Support** | **Special Educational Needs (SEN registered), Learning Support (LS), Gifted & Talented (G&T): (please specify):**<br>• Ahmed usually finishes tasks quickly so will be provided with extension activities to deepen understanding and maintain engagement.<br>• Abdullah has been absent for the previous three lessons and will receive targeted support to review key concepts and catch up with the class.<br>• Additional time and support for Shamma; visual guides to be printed larger.<br>• 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:**<br>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<br>If 'Other' please specify: | | |
| **Higher-Order Thinking Focus** | **Please highlight all that apply:**<br>Analysis / Evaluation / Justification / Reasoning / Hypothesis generation / Making connections / Drawing conclusions / Synthesizing information / Designing solutions / Arguing a position / Constructing explanation / Other<br>If 'Other' please specify: | | |
| **Resources / Tools** *(e.g. textbook pages, manipulatives, digital tools, AI etc)* | • Whiteboard/Projector<br>• Individual whiteboards / paper<br>• Rulers, protractors (optional for extension)<br>• Visual aid of key rules, formula & properties<br>• Textbook pages 24-27 with differentiated problems<br>• Investigation task for higher ability / G&T<br>• Gap-fill exercise for struggling students<br>• Algebraic angle problems (for higher-ability students) -textbook page reference 27-28 | | |
| **Seating Arrangements** | **Please highlight all that apply:**<br>Individual / Pairs / Groups (same level) / Groups (mixed levels) / Workstations (rotations) / Flexible / U-shape / Other<br>• If 'Other' please specify: | | |
| **Self-Reflection** | What intervention / acceleration is required based on this formative data?<br>• Struggling students will receive scaffolded support through gap-fill tasks, while higher-ability students will engage in polygon investigations.<br>• Further strategies to be finalized after lesson upon review of student feedback and responses. | | |

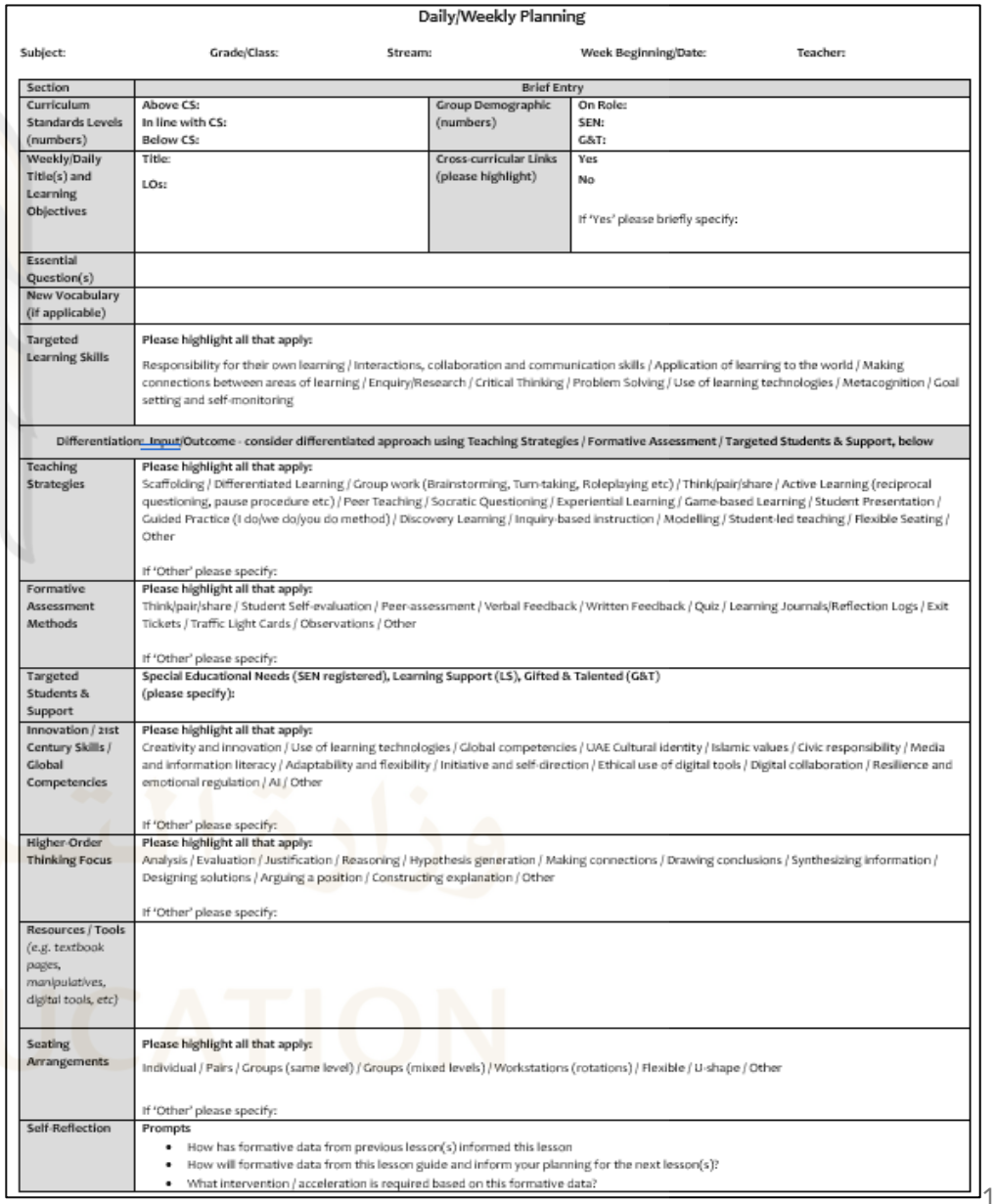
*Lesson Plan Exemplar*

# 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.

*Lesson Plan Template*



**Daily/Weekly Planning**

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

| Section | Brief Entry | | |
|---|---|---|---|
| Curriculum Standards Levels (numbers) | Above CS:<br>In line with CS:<br>Below CS: | Group Demographic (numbers) | On Role:<br>SEN:<br>G&T: |
| Weekly/Daily Title(s) and Learning Objectives | Title:<br>LOs: | Cross-curricular Links (please highlight) | Yes<br>No<br>If 'Yes' please briefly specify: |
| Essential Question(s) | | | |
| New Vocabulary (if applicable) | | | |
| Targeted Learning Skills | Please highlight all that apply:<br>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:<br>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<br>If 'Other' please specify: | | |
| Formative Assessment Methods | Please highlight all that apply:<br>Think/pair/share / Student Self-evaluation / Peer-assessment / Verbal Feedback / Written Feedback / Quiz / Learning Journals/Reflection Logs / Exit Tickets / Traffic Light Cards / Observations / Other<br>If 'Other' please specify: | | |
| Targeted Students & Support | Special Educational Needs (SEN registered), Learning Support (LS), Gifted & Talented (G&T)<br>(please specify): | | |
| Innovation / 21st Century Skills / Global Competencies | Please highlight all that apply:<br>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<br>If 'Other' please specify: | | |
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| Resources / Tools (e.g. textbook pages, manipulatives, digital tools, etc) | | | |
| Seating Arrangements | Please highlight all that apply:<br>Individual / Pairs / Groups (same level) / Groups (mixed levels) / Workstations (rotations) / Flexible / U-shape / Other<br>If 'Other' please specify: | | |
| Self-Reflection | Prompts<br>• How has formative data from previous lesson(s) informed this lesson<br>• How will formative data from this lesson guide and inform your planning for the next lesson(s)?<br>• What intervention / acceleration is required based on this formative data? | | |

# 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.

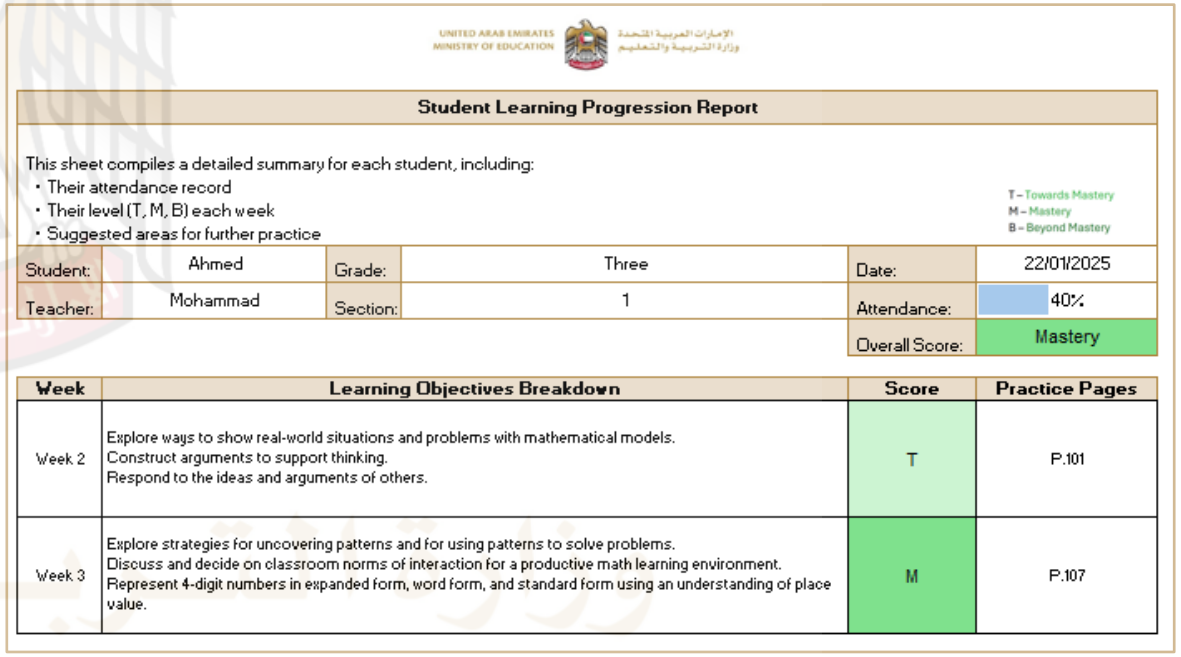
The tool is built around **four** core components:

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.



UNITED ARAB EMIRATES MINISTRY OF EDUCATION — الإمارات العربية المتحدة وزارة التربية والتعليم

**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: | Ahmed | Grade: | Three | Date: | 22/01/2025 |
| Teacher: | Mohammad | Section: | 1 | Attendance: | 40% |
| | | | | Overall Score: | Mastery |

| Week | Learning Objectives Breakdown | Score | Practice Pages |
|---|---|---|---|
| Week 2 | Explore ways to show real-world situations and problems with mathematical models.<br>Construct arguments to support thinking.<br>Respond to the ideas and arguments of others. | T | P.101 |
| Week 3 | Explore strategies for uncovering patterns and for using patterns to solve problems.<br>Discuss and decide on classroom norms of interaction for a productive math learning environment.<br>Represent 4-digit numbers in expanded form, word form, and standard form using an understanding of place value. | M | P.107 |

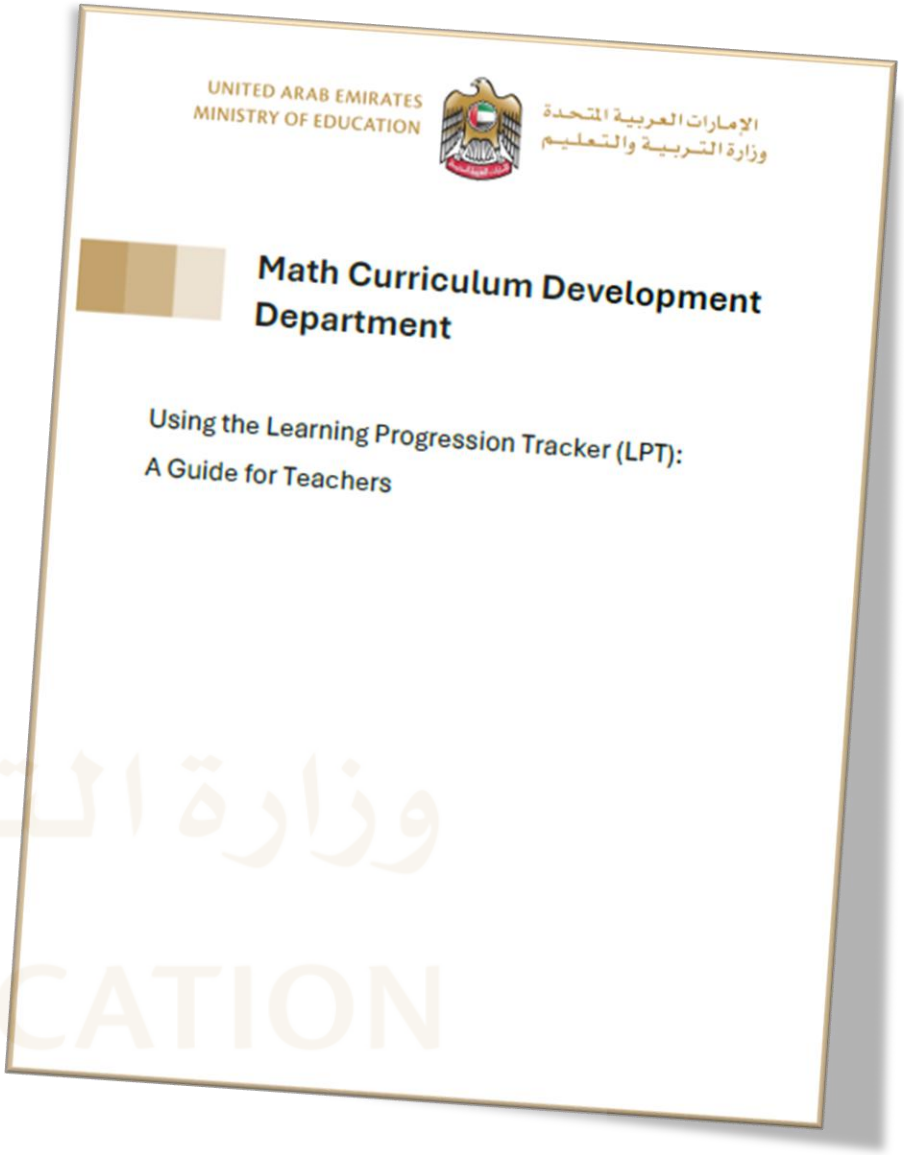
Learning Progression Tracker

# 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:

Guide for Teachers



# Teaching & Learning Resources

## Digital Platforms

Reveal MATH

Common Core State Standards

Illustrative Mathematics
LEARN MATH FOR LIFE

Khan Academy

Alef EDUCATION ألف للتعليم

Mc Graw Hill ALEKS

desmos classroom

GeoGebra

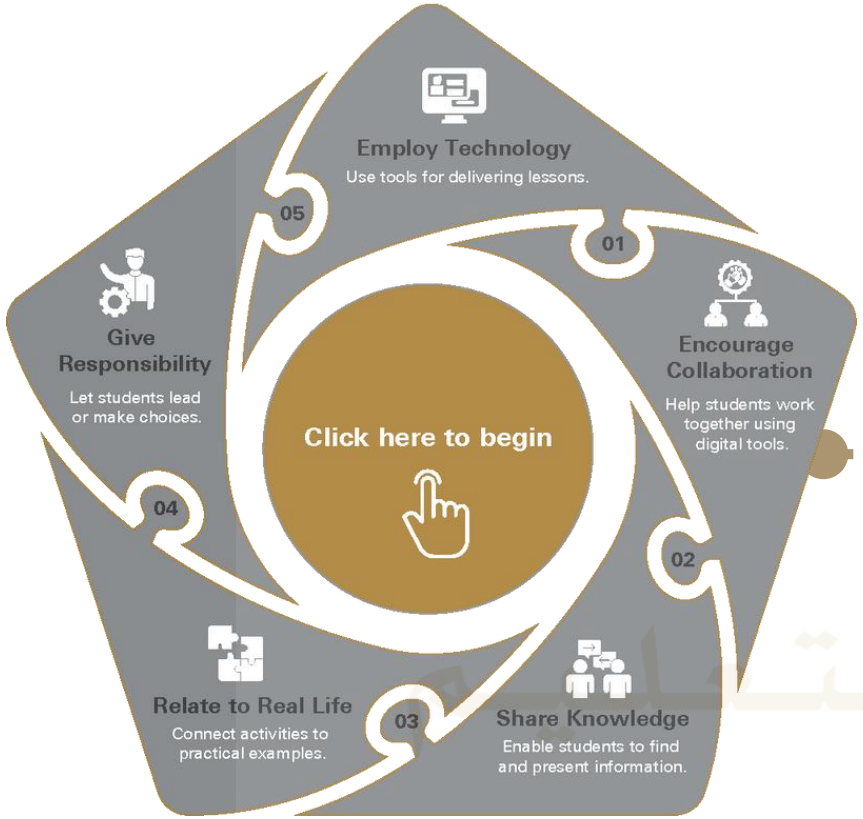
IXL LEARNING

External links are provided for educational purposes only. Teachers should preview all materials to ensure suitability and cultural appropriateness for use in UAE classrooms.

# Digital Tool Kit Application

Plan smarter. Teach with purpose. Use digital tools that truly enhance learning.

The Digital Tool Kit is a non-judgmental planning and reflection tool designed to help educators intentionally integrate digital tools into their lessons




## Why Use It?

The tool supports teachers to:

- Link tech to real learning goals
- Differentiate without adding workload
- Plan with a clear, student-centered purpose
- Identify your growth areas in digital teaching
- Share ideas across departments

## How It Works

The toolkit uses a simple planning grid:

- **Vertical Axis** = What kind of learning is being planned?
- **Horizontal Axis** = To what extent does technology enhance that learning?

## Start Here: 3 Simple Steps

**Use the Planning Grid** — Choose your teaching focus and tech level

**Learn how to use the tool in 2 minutes**

**Build Your Skills —** Join a digital pedagogy course

# What Is the Digital Tool Kit Matrix?

Plan with Purpose: Using the Digital Tool Kit Matrix

## The matrix helps you reflect and plan

- **Vertical Axis** (Learning Contexts): Employ → Collaborate → Connect → Relevance → Set Goals
- **Horizontal Axis** (Integration Levels): Substitution → Augmentation → Modification → Infusion → Transformation

## Leverage the Digital Tool Kit App in Seconds

Make the Toolkit Work *for* You

1. **Choose what kind of learning your students will do**
2. **Decide how deeply tech will enhance that learning**

**Click a box, not build from scratch**
Select your digital intent (1 grid box)
The app does the thinking

**Instant examples and planning tips**
Each box includes tool suggestions & lesson ideas
Ideas tailored to your level and focus

**Skill up as you go**
Take learning curve courses
Build confidence using the supporting resources in the app

**Use it for**:
✓ Quick planning
✓ Peer coaching
✓ Lesson reflection
✓ Team conversations

| Level | Basic | Enhanced | Creative | Advanced | Innovative |
|---|---|---|---|---|---|
| **Employ Technology:** Use tools for delivering lessons. | Uses basic tools like videos or quizzes. | Incorporates interactive platforms. | Embeds multimedia into lessons. | Includes real-world applications. | Uses immersive tools (AR/VR). |
| **Encourage Collaboration:** Help students work together using digital tools. | Basic group tasks. | Students work in groups with shared tools. | Students co-create with digital tools. | Collaboration includes real-world scenarios. | Global or external collaboration. |
| **Share Knowledge:** Enable students to find and present information. | Students consume teacher-provided content. | Encourages online exploration. | Students collect and share findings. | Solves real-world problems using tools. | Students create independent solutions. |
| **Relate to Real Life:** Connect activities to practical examples | Basic daily life examples. | Projects tied to relatable contexts. | Practical scenario-based tasks. | Analyse real-world challenges. | Complex real-world problem-solving. |
| **Give Responsibility:** Let students lead or make choices. | Minimal student choice. | Students present task outcomes. | Flexible tasks with choice of tools. | Students plan and design their tasks. | Full task/project ownership. |

Educational Materials and Learning Resources Development Department - Curriculum and Assessment Sector

# Grade 4 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)*** | ***Number and Operations – Fractions (Domain 4.NF)*** | ***Geometry (Domain 1.G)*** | ***Measurement & Data (Domain 1.MD)*** |
| Use the four operations with whole numbers to solve problems.<br><br>Gain familiarity with factors and multiples.<br><br>Generate and analyze patterns. | Generalize place value understanding for multi-digit whole numbers.<br><br>Use place value understanding and properties of operations to perform multi-digit arithmetic. | Extend understanding of fraction equivalence and ordering.<br><br>Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.<br><br>Understand decimal notation for fractions and compare decimal fractions. | Draw and identify lines and angles, and classify shapes by properties of their lines and angles. | Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.<br><br>Represent and interpret data.<br><br>understand concepts of angle and measure angles. |

# Term 2 Overview
# Grade 4 Mathematics

| Lesson Number | Module 7 | Module 8 | Module 9 | Module 10 |
|---|---|---|---|---|
| | Division Strategies with Multi-Digit Dividends and 1-Digit Divisors | Fraction Equivalence | Addition and Subtraction Meanings and Strategies with Fractions | Addition and Subtraction Strategies with Mixed Numbers |
| 1 | Divide Multiples of 10, 100, or 1,000 | Equivalent Fractions | Understand Decomposing Fractions | Understand Decomposing Mixed Numbers |
| 2 | Estimate Quotients | Generate Equivalent Fractions using Models | Represent Adding Fractions | Represent Adding Mixed Numbers |
| 3 | Find Equal Shares | Generate Equivalent Fractions using Number Lines | Add Fractions with Like Denominators | Add Mixed Numbers |
| 4 | Understand Partial Quotients | Compare Fractions using Benchmarks | Represent Subtracting Fractions | Represent Subtracting Mixed Numbers |
| 5 | Divide 4-Digit Dividends by 1-Digit Divisors | Other Ways to Compare Factions | Subtract Fractions with Like Denominators | Subtract Mixed Numbers |
| 6 | Understand Remainders | | Solve Problems Involving Fractions | Solve Problems Involving Mixed Numbers |
| 7 | Make Sense of a Remainder | | | |
| 8 | Solve Multi-Step Problems Using Division | | | |

# Division Strategies with Multi-Digit Dividends and 1-Digit Divisors

## Notes & Guidance

This unit focuses on developing students' understanding of division as the process of sharing and grouping numbers.
Students build on their knowledge of multiplication from previous units to learn how to divide large numbers efficiently.
They explore multiple strategies, including area models, partial quotients, and standard algorithms, while using place value understanding to explain their reasoning.
Through real-world word problems, students also learn to interpret remainders meaningfully (e.g., rounding up, ignoring, or expressing as fractions).
By the end of the unit, students can connect division to multiplication, demonstrate logical reasoning, and solve multi-step problems confidently using models, equations, and estimation.

## Pedagogy

Effective teaching in this unit emphasizes the connection between division and multiplication.
Teachers should use visual representations such as rectangular arrays and area models to show how division can be seen as partitioning.
Students benefit from guided discovery, where they decompose numbers using place value (e.g., dividing thousands, hundreds, and tens separately).
Instruction should also include think - allow to demonstrate reasoning and promote understanding of each division step.
Word problems that require interpreting remainders in meaningful real-life contexts — such as sharing supplies or dividing objects — help students develop a deeper understanding of when and how to apply division strategies.

## Key Skills

- Divide multi-digit numbers by one-digit numbers accurately using place value and properties of operations.
- Apply area models and partial quotient strategies to visualize and solve division problems.
- Interpret remainders appropriately based on real-world scenarios.
- Check quotients using multiplication to ensure accuracy.
- Estimate quotients using rounding or compatible numbers.
- Solve multi-step word problems involving all four operations, including those requiring reasoning about remainders.
- Assess the reasonableness of answers using mental computation and estimation.
- Explain their thinking clearly, using models, equations, and verbal reasoning.

## International Assessment Links

**Number: Operations with Whole Numbers**

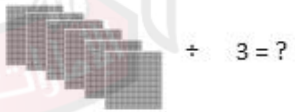
This unit directly supports TIMSS Grade 4 by developing students' ability to solve division problems, interpret remainders, and apply number operations in real-life contexts. It reinforces conceptual understanding of division as equal grouping and sharing, key to the TIMSS "Number" domain.

**Quantity – Change and Relationships (Mathematical Literacy)**

This unit lays early groundwork for PISA by building problem-solving and reasoning skills through interpreting division in multi-step, real-world situations. Students practice modeling, estimation, and justification–core PISA competencies in mathematical literacy and quantitative reasoning..

# Division Strategies with Multi-Digit Dividends and 1-Digit Divisors

- This section aims to identify the fundamental knowledge and skills that students already possess before starting the module, as well as any areas that may need support or review to strengthen new learning. Teachers can use this section to conduct a quick check of

| Question Number | Question | DOK Level | Standard | SMPs |
|---|---|---|---|---|
| 1 | Multiply $60 \times 3$. Explain how multiplying by a multiple of $10$ is different from $6 \times 3$.   | 1 | 4.NBT.B.6 | SMP 2, 7, 8 |
| 2 | Use mental math to divide 600 ÷ 3. Show how you used place value.   | 2 | 4.NBT.B.6 | SMP 2, 6, 7 |
| 3 | A bag has 48 marbles. If each box holds 8, how many boxes are needed? | 2 | 3.OA.C.7 (review) | SMP 1, 2, 4 |
| 4 | Write a story problem that can be solved by 512 ÷ 8 and explain. | 3 | 4.OA.A.3 | SMP 2, 3, 4 |
| 5 | Estimate 3,800 ÷ 8 ≈ ? Explain why your estimate is reasonable. | 3 | 7.G.A.3 | SMP 1, 2, 6, 8 |

# Module 7 – Division Strategies with Multi-Digit Dividends and 1-Digit Divisors
## Learning Objectives and Standards

| Standards | | Learning Objectives | Formative Assessment Criteria |
|---|---|---|---|
| 4.NBT.B.6 Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.<br><br>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. | L1 | • Use basic division facts, the relationship between multiplication and division, and place value to divide multiples of 10, 100, or 1,000.<br>• Use number patterns to divide multiples of 10, 100, or 1,000. | • Use what you know about multiplication to solve $2{,}400 \div 8$. Explain how multiplication helped you find the answer.<br>• Look at this pattern: $240 \div 10 = 24$, $2{,}400 \div 10 =$ ___. Describe the pattern you see. |
| | L2 | • Use compatible numbers and related division facts to estimate quotients.<br>• Find a reasonable range for the estimate of a quotient. | • Estimate $398 \div 8$ using a compatible number. Show how you chose your estimate. 👉 Expected: $400 \div 8 \approx 50$; because 400 is close to 398 and easy to divide..<br>• Estimate $853 \div 9$ to the nearest ten. What is a reasonable range for the quotient? 👉 Expected: $9 \times 90 = 810$ and $9 \times 100 = 900$, so the quotient is between 90 and 100. |
| | L3 | • Use the equal share meaning of division to divide 2-digit dividends by 1-digit divisors. | • Ali has 36 stickers to share equally among 4 friends. How many does each friend get? |
| | L4 | • Use partial quotients to divide 3-digit dividends by 1-digit divisors. | • Solve $252 \div 6$ using partial quotients. Show each step. |
| | L5 | • Use partial quotients to divide 4-digit dividends by 1-digit divisors. | • Find $3{,}248 \div 8$ using partial quotients. Show your steps. |
| | L6 | • Divide multi-digit whole numbers that result in a quotient and a remainder.<br>• Explain what a remainder means in the context of the problem. | • Divide $587 \div 9$. Write the quotient and remainder<br>• A bus holds 9 students per row. If 65 students need seats, how many rows will be full and how many students will be left without a row? |
| | L7 | • Determine how to interpret the remainder of a division equation based on the of the problem. | • A teacher has 50 cupcakes to pack in boxes of 6. How many boxes does she need? |
| | L8 | • Solve multi-step word problems involving division by representing the problems using equations with a variable. | • A school bought 432 pencils to be shared equally among 12 classes. Each class then divides their share equally among 24 students. How many pencils does each student get? Use a variable to represent the unknown. |

## Notes

- The Instructional Planner (IPs) and Scope & Sequence are available on the LMS Platform.
- Grade 4 Teacher Edition Book – MINHAJI

# Divide Multiples of 10, 100, or 1,000

## Learning Objectives

- Use basic division facts, the relationship between multiplication and division, and place value to divide multiples of 10, 100, or 1,000.
- Use number patterns to divide multiples of 10, 100, or 1,000.

| Towards Mastery | Mastery | Beyond Mastery |
|---|---|---|
| Students divide multiples of 10 by one-digit divisors with support. They rely on skip counting or repeated subtraction rather than recognizing the place value pattern. | Students use the relationship between multiplication and division and place value reasoning to divide multiples of 10, 100, or 1,000 accurately. | Students generalize patterns and apply reasoning to solve and explain division involving large multiples of 10, 100, or 1,000. They can create real-world contexts and justify their thinking. |

## Misconceptions and Notes

Students ignore place value and divide only the first digit (e.g., treating 600 ÷ 3 as 6 ÷ 3 = 2).
**Fix**: Use base-ten blocks or place value charts to connect the operation to groups of tens, hundreds, or thousands.
Students believe zeros "disappear" when dividing by 10 or 100.
**Fix:** Reinforce the idea that dividing by 10 shifts digits one place to the right — the zeros remain part of the number's structure.

## Basic Mathematical Skills

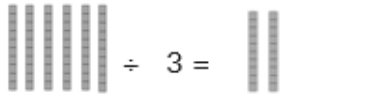
| Skill 1 | Skill 2 |
|---|---|
| **Understanding of Place Value and the Effect of Dividing by Powers of Ten:** Students must understand how each digit's position represents a power of ten, and how dividing by 10, 100, or 1,000 shifts digits to the right on the place value chart. | **Mastery of Basic Division and Multiplication Facts (1–10):** Students must fluently recall and apply basic multiplication and division facts to recognize related facts in larger numbers. |

## Resources

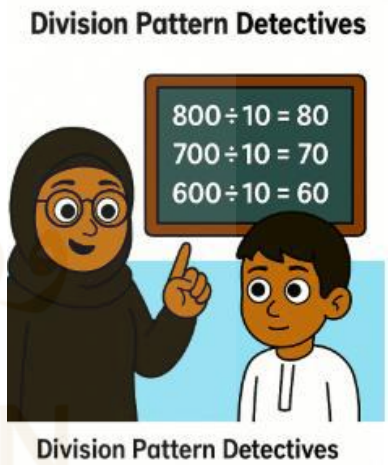
- Grade 4 Reveal Math , Teacher Edition e-Book, Volume 1 , Student Edition e-Book, Volume 1
- Game Station Resource Book – Grade 4 ( Reveal Platform ) Page 109
- Divide multiples of 10, 100, and 1,000 by 1-digit numbers (practice) | Khan Academy
- https://www.ixl.com/math/grade-4/divide-numbers-ending-in-zeros-by-1-digit-numbers
- https://www.ixl.com/math/grade-4/division-patterns-over-increasing-place-values

| Domain |
|---|
| Numbers & Operations in Base Ten |
| **Standards** |
| 4.NBT.B.6 |
| **SMPs** |
| MP 2 |
| **Key Vocabulary** |
| Dividend<br>Divisor<br>Multiple<br>Quotient |

# Divide Multiples of 10, 100, or 1,000

| Towards Mastery | Mastery | Beyond Mastery |
|---|---|---|
| **Q1**<br>Divide 6 tens ÷ 3. Explain how you found your answer.<br>👉 *Expected Answer:* 20; student uses repeated subtraction or known facts (6 ÷ 3 = 2 tens = 20).<br>  <br>6 tens ÷ 3 = 2 tens = 20<br><br>**Q2**<br>There are 90 pencils to be packed equally into 3 boxes. How many pencils go in each box?<br>👉 *Expected Answer:* 90 = 9 tens ÷ 3 = 3 tens = 30 pencils per box; equal sharing shown.<br><br>✅ **Pass Criteria:**<br>➢ Student know how to divide multiples of 10 by using place value.<br>➢ Student can represent division as equal grouping or repeated subtraction. | **Q1**<br>Divide 600 ÷ 3. Explain how place value helps you solve it.<br>👉 *Expected Answer:* 200; 6 ÷ 3 = 2, then multiply by 100.<br>  <br>6 Hundreds ÷ 3 = 2 Hundreds<br><br>**Q2**<br>A shop divides 3,000 AED equally among 6 workers. How much does each worker receive?<br>👉 *Expected Answer:* 500 AED; 30 ÷ 6 = 5 × 100= 500.<br><br>✅ **Pass Criteria:**<br>➢ Student applies place value reasoning to divide multiples of 100 and 1,000.<br>➢ Student connects multiplication and division relationships correctly. | **Q1**<br>If 900 ÷ 3 = 300, what is 9,000 ÷ 3? Explain how you know.<br>👉 *Expected Answer:* 3,000; the dividend and quotient each increase by a factor of 10.<br><br>**Q2**<br>Mr. Khalid has AED 12,000 to distribute evenly among 6 classrooms. Each classroom shares it equally among 10 students. How much does each student get?<br>👉 *Expected Answer:* AED 200 ;12,000 ÷ 6 = 2,000, then 2,000 ÷ 10 = 200.<br><br>✅ **Pass Criteria:**<br>➢ Student generalizes division patterns across place value shifts.<br>➢ Student explains multi-step division with reasoning and efficiency. |

# Divide Multiples of 10, 100, or 1,000

| | Towards Mastery | Mastery | Beyond Mastery |
|---|---|---|---|
| Activity Title | Grouping Game with Base-Ten Blocks | Place Value Division Cards | Division Pattern Detectives |
| Type of Activity | Hands-on / Manipulative-based | Manipulative-based / Partner Activity | Problem-Solving / Inquiry-Based |
| Summary of Activity | Students use base-ten blocks to model problems like $90 \div 3$ or $60 \div 2$. They physically group tens into equal sets to visualize division and count how many groups are formed. This builds the concept of "equal sharing" for multiples of 10.   | Students are given cards with problems like $400 \div 2$, $900 \div 3$, $400 \div 6$. They use place value charts to break the dividend into hundreds and tens, showing how each digit is divided. Partners check each other's reasoning. | Working in pairs, students explore division equations (e.g., $800 \div 10 = 80$, $700 \div 10 = ?$) and record observed patterns in a table. They then predict results of new problems by generalizing rules.   |

# Estimate Quotients

## Learning Objectives

- Use compatible numbers and related division facts to estimate quotients.
- Find a reasonable range for the estimate of a quotient.

| Towards Mastery | Mastery | Beyond Mastery |
|---|---|---|
| Students can round dividends and divisors to the nearest ten or hundred to make division easier and find approximate quotients. | Students use compatible numbers (numbers that divide evenly) to make more accurate quotient estimates and can explain their reasoning. | Students can generate two reasonable estimates (lower and upper bounds) and justify which one best fits a given real-world scenario. |

## Misconceptions and Notes

Students may think rounding always gives the exact quotient.
**Fix:** Emphasize that estimates are close approximations and show differences between rounded and exact results.
Students may round both numbers inconsistently (e.g., rounding one up and the other down).
**Fix:** Model how rounding both numbers in the same direction (up or down) gives a consistent estimate.

## Basic Mathematical Skills

| Skill 1 | Skill 2 |
|---|---|
| **Fluency with Multiplication Facts:** Students should recall basic multiplication facts up to $12 \times 12$ to identify compatible numbers easily. | **Understanding of Place Value:** Students should understand how rounding to the nearest ten, hundred, or thousand affects the quotient. |

## Resources

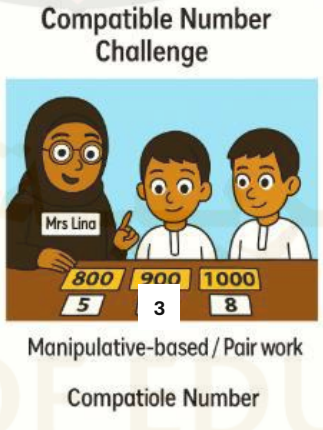
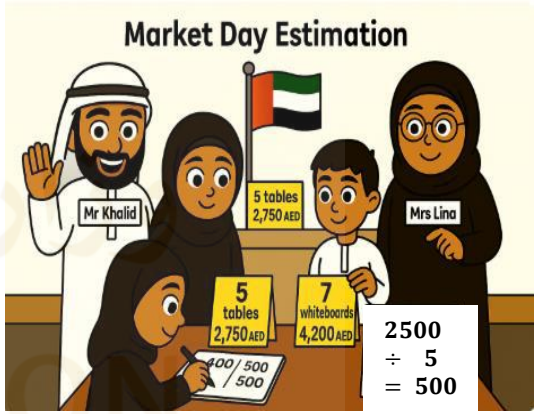
- Grade 4 Reveal Math , Teacher Edition e-Book, Volume 1 , Student Edition e-Book, Volume 1
- Game Station Resource Book – Grade 4 ( Reveal Platform ) Page 113
- Estimate quotients (3- and 4-digit divided by 1-digit) (practice) | Khan Academy
- https://www.ixl.com/math/grade-4/estimate-quotients-using-compatible-numbers-1-digit-divisors

| Domain |
|---|
| Numbers & Operations in Base Ten |
| **Standards** |
| 4.NBT.B.6 |
| **SMPs** |
| MP 2 |
| **Key Vocabulary** |
| Compatible<br>Numbers<br>Range |

# Estimate Quotients

| Towards Mastery | Mastery | Beyond Mastery |
|---|---|---|
| **Q 1**<br>Round 420 ÷ 5 to find an estimate.<br>👉 **Expected Answer:** Round 420 to 400 → 400 ÷ 5 = 80<br>40 ‖ ÷ 5 = 8 ‖ = 8 tens = 80<br>**40 tens ÷ 5 = 8 tens = 80**<br><br>**Q 2**<br>Estimate the quotient: 870 ÷ 9.<br>👉 **Expected Answer:** 900 ÷ 9 = 100<br>90 ‖ ÷ 9 = 10 ‖ = 10 tens = 100<br>**90 tens ÷ 9 = 10 tens = 100**<br><br>✅ **Pass Criteria:**<br>Student rounds numbers appropriately to the nearest ten or hundred and computes a reasonable estimate for the quotient. | **Q 1**<br>Use compatible numbers to estimate 740 ÷ 8.<br>👉 **Expected Answer:** Use 740 ≈ 720 → 720 ÷ 8 = 90<br><br>**Q 2**<br>Estimate 4,900 ÷ 6 using a related fact.<br>👉 **Expected Answer:** 4900 ≈ 4800 → 4800 ÷ 6 = 800<br><br>✅ **Pass Criteria:**<br>Student selects compatible numbers and explains that the estimate is based on multiplication facts and place value reasoning. | **Q 1**<br>Khalid scored a total of 6,100 points playing a camel racing video game.<br>If he scored about the same number of points in each of his 7 races, about how many points did he score in each race? Explain your answer<br><br>👉 **Expected Answer:** 6100 ≈ 6300 → 6300 ÷ 7 = 900<br>👉 **Expected Answer:** 6100 ≈ 5600 → 5600 ÷ 7 = 800<br><br>**Discussion Extension: The range of estimation lies between 800 and 900 but the accurate answer is closer to 900 than 800.**<br><br>✅ **Pass Criteria:**<br>Student finds two boundary estimates and justifies a final reasonable range based on context and division patterns. |

# Estimate Quotients

| | Towards Mastery | Mastery | Beyond Mastery |
|---|---|---|---|
| Activity Title | Rounding Race | Compatible Number Challenge | Market Day Estimation |
| Type of Activity | Hands-on / Group work | Manipulative-based / Pair work | Real-life application / Digital or written task |
| Summary of Activity | Students work in small teams with flashcards showing division problems like 240 ÷ 3 or 560 ÷ 7. Each team races to round both numbers to the nearest ten or hundred and quickly write the estimated quotient on mini-whiteboards. Mr. Khalid announces correct estimates, reinforcing that rounding helps approximate division easily.   | Mrs. Lina gives Aisha and Adam sets of "compatible number" cards (e.g., 800, 900, 1 000 ÷ 3, 5, 8). Students pair dividends with divisors that divide evenly and record the quotient on a chart. They then discuss which estimates are closest to exact answers and why using known multiplication facts improves their accuracy.   | Students help Mr. Khalid plan purchases for a school market. One of the example: 2750 AED for 5 tables — estimate cost per table. They must find two boundary estimates (lower and upper), justify which is most reasonable, and record reasoning using "Because…" statements. The task ends with group presentations comparing estimation strategies.   |

# Find Equal Shares

## Learning Objectives

- Use the equal share meaning of division to divide 2-digit dividends by 1-digit divisors.

| Towards Mastery | Mastery | Beyond Mastery |
|---|---|---|
| Students can model simple equal sharing situations using concrete objects (e.g., counters, cubes, or pictures) to divide 2-digit numbers evenly by 1-digit numbers with support. | Students use the equal-share concept and place value understanding to divide 2-digit numbers by 1-digit numbers accurately, both with and without manipulatives. | Students explain and justify their reasoning for division using equal sharing, apply it to real-life contexts, and identify situations with remainders. |

## Misconceptions and Notes

Students may think division always results in whole numbers.
**Fix:** Use real-life examples (e.g., dividing 50 pencils among 8 students) to show that division can leave remainders and that these remainders have real meaning.
Students may confuse the "number of groups" with the "number in each group."
**Fix:** Use equal-sharing word problems and visual models (like counters or arrays) to clarify that the divisor tells how many groups to make or how many items go in each group.

## Numeracy Skills

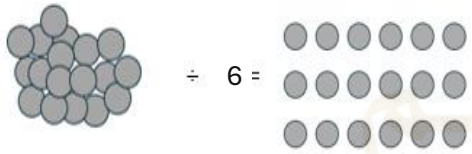
| Skill 1 | Skill 2 |
|---|---|
| **Understanding of Multiplication and Division Relationship:** Students must know that division is the process of finding equal groups or shares. | **Place Value Understanding:** Students should be able to decompose numbers (e.g., 48 as 40 + 8) to distribute quantities evenly. |

## Resources

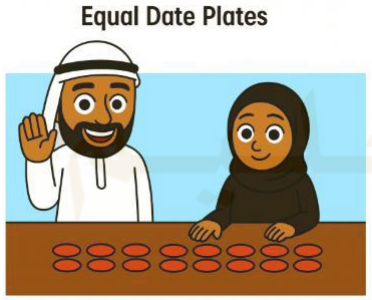
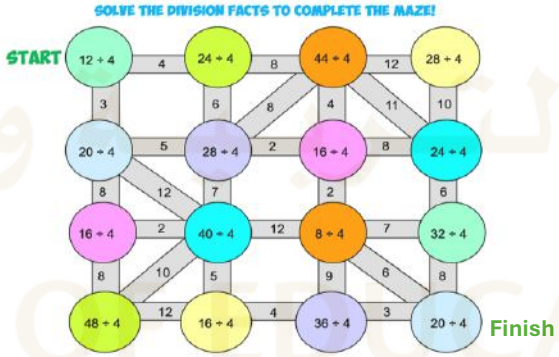
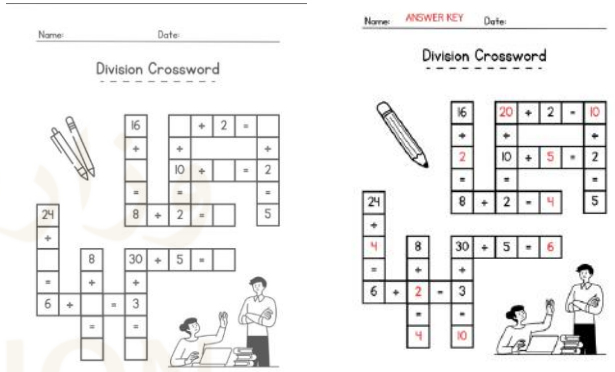
- Grade 4 Reveal Math , Teacher Edition e-Book, Volume 1 , Student Edition e-Book, Volume 1
- Game Station Resource Book – Grade 4 ( Reveal Platform ) Page 113
- https://www.ixl.com/math/grade-4/divide-2-digit-numbers-by-1-digit-numbers-using-arrays
- https://www.ixl.com/math/grade-4/divide-2-digit-numbers-by-1-digit-numbers-using-area-models

| Domain |
|---|
| Numbers & Operations in Base Ten |
| **Standards** |
| 4.NBT.B.6 |
| **SMPs** |
| MP 2 |
| **Key Vocabulary** |
| dividend<br>divisor<br>equal sharing<br>quotient |

# Find Equal Shares

| Towards Mastery | Mastery | Beyond Mastery |
|---|---|---|
| **Q 1**<br>Aisha has **30 dates** to share equally among **3 friends**. How many dates will each friend get?<br>👉 **Expected Answer:** Each friend gets **10 dates**.<br>  <br>**Q 2**<br>Divide **18 counters** equally among **6 persons**. How many counters are received by each person?<br>👉 **Expected Answer: 3 counters per person**.<br>  <br>✅ **Pass Criteria:**<br>Student can divide a 2-digit number by a 1-digit divisor using equal grouping or repeated subtraction.<br>Student gives equal groups with no remainder. | **Q 1**<br>Mr. Khalid packs **48 water bottles** equally into **6 boxes**. How many bottles are in each box?<br>👉 **Expected Answer: 8 bottles per box**.<br><br>**Q 2**<br>Mrs. Lina buys **56 snack packs** for a class of **8 students**. How many snacks will each student receive?<br>👉 **Expected Answer: 7 snack packs per student**.<br><br>✅ **Pass Criteria:**<br>Student can divide 2-digit numbers by 1-digit divisors accurately using base-ten reasoning or mental division.<br>Student verifies that the quotient is reasonable. | **Q 1**<br>Adam shares **50 pencils** equally among **8 students**. How many pencils does each get? Is there any remainder?<br>👉 **Expected Answer:** Each gets **6 pencils, 2 left over**.<br><br>**Q 2**<br>A field trip has **47 students** and **5 vans**. How many students fit in each van, and how many remain?<br>👉 **Expected Answer: 9 students per van, 2 students remain**.<br><br>✅ **Pass Criteria:**<br>Student can interpret quotients with remainders and explain what the remainder represents in real-life context.<br>Student justifies answers using models, reasoning, or equations. |

# Find Equal Shares

| | Towards Mastery | Mastery | Beyond Mastery |
|---|---|---|---|
| Activity Title | Equal Date Plates | Division Maze Challenge | Division Crossword Challenge |
| Type of Activity | Hands-on / Manipulative-based | Game-based Practice | Problem-Solving Puzzle |
| Summary of Activity | Students use counters or paper "dates" to model equal sharing. Each student receives 16 counters and is asked to divide them equally among 2 or 4 friends. They physically group the counters to visualize equal shares and record the results. The teacher prompts with real-life contexts (e.g., sharing plates of dates during Ramadan gatherings).   | Students complete a Division Maze Challenge by solving simple division facts to navigate from START to FINISH. Each correct quotient reveals the next possible path in the maze. As they progress, students practice division fluency and reasoning, connecting division to multiplication to check their answers. This fun, game-based activity encourages accuracy, problem-solving, and collaboration while reinforcing key division concepts.   | Students complete a Division Crossword Puzzle by solving division facts to fill in all the missing numbers in the grid. Each blank space represents either a quotient or a divisor, and students must use logic and division knowledge to make sure all the horizontal and vertical equations are correct. For example, if one row reads "16 ÷ 2 = ___," the student fills in 8.   |

# Understand Partial Quotients

## Learning Objectives

- Use partial quotients to divide 3-digit dividends by 1-digit divisors.

| Towards Mastery | Mastery | Beyond Mastery |
|---|---|---|
| Students can use repeated subtraction or place value reasoning to begin dividing 3-digit numbers by 1-digit divisors with teacher support.<br><br>Example: "Aisha has 324 prayer beads to be packed into boxes of 3 beads each. How many boxes will she fill? "Students use repeated subtraction or grouping (100s, 10s, 1s) to find 108 boxes with guidance. | Students independently use the partial quotient method to divide 3-digit numbers by 1-digit divisors, recording each step and explaining their reasoning.<br><br>Example. Khalid distributes 432 books equally among 4 classrooms. Students use partial quotients:4 × 100 = 400 (Subtract → 32 left) 4 × 8 = 32 (Subtract → 0 left)<br>✅ Answer: 108 books per class. | Students efficiently apply the partial quotient strategy to complex 3-digit division problems and justify their reasoning in multiple ways (equations, area models, or verbal explanation).<br><br>Example (UAE Context):Mrs. Lina shares 528 pencils among 6 groups. Students find 6 × 80 = 480 → 48 left 6 × 8 = 48 → 0 left<br>✅ Answer: 88 pencils per group. Then, they explain that partial quotients show how the total is divided in "chunks." |

## Misconceptions and Notes

Students may think partial quotients must always start with the highest multiple (e.g., ×100).
**Fix:** Model flexible starting points (e.g., ×50 or ×20) to show strategy choice doesn't affect the final answer.

## Numeracy Skills

| Skill 1 | Skill 2 |
|---|---|
| **Understanding of Place Value:** Students must know how to break numbers into hundreds, tens, and ones. | **Fluency in Multiplication Facts:** Students should recall multiplication tables up to 10 for efficient partial quotient calculation. |

## Resources

- Grade 4 Reveal Math , Teacher Edition e-Book, Volume 1 , Student Edition e-Book, Volume 1
- Game Station Resource Book – Grade 4 ( Reveal Platform ) Page 116
- https://www.ixl.com/math/grade-4/divide-using-the-distributive-property

| Domain |
|---|
| Numbers & Operations in Base Ten |
| **Standards** |
| 4.NBT.B.6 |
| **SMPs** |
| MP 2 |
| **Key Vocabulary** |
| Partial Quotient |

# Understand Partial Quotients

| Towards Mastery | Mastery | Beyond Mastery |
|---|---|---|
| **Q1**<br>There are **216 prayer mats** to be arranged in **3 rows**. How many mats will be in each row?<br>👉 **Expected Answer:** 3 x 70 = 210 → 6 left → 3 x 2 = 6 → **70 + 2 = 72 mats per row**<br><br>**Q2**<br>Aisha wants to share **245 beads** equally among **5 friends**. How many beads does each friend get?<br>👉 **Expected Answer:** 5 x 40 = 200 → 45 left → 5 x 9 = 45 → **40 + 9 = 49 beads per friend**<br><br>✅ **Pass Criteria:**<br>Student uses repeated subtraction or place value grouping to find partial quotients correctly.<br>Student records each step clearly and gets an accurate quotient. | **Q1**<br>Mr. Khalid is dividing **384 pencils** equally into **4 boxes**. How many pencils go in each box?<br>👉 **Expected Answer:** 4 × 90 = 360 → 24 left → 4 × 6 = 24 → **96 pencils per box**<br>$360 \div 4 = 90$<br>$24 \div 4 = 6$<br>$90 + 6 = 96$<br>  <br><br><br>**Q2**<br>There are **552 water bottles** in a school. They are packed into **6 cartons** equally. How many bottles are in each carton?<br>👉 **Expected Answer:** 6 × 90 = 540 → 12 left → 6 × 2 = 12 → **92 bottles per carton**<br>$540 \div 6 = 90$<br>$12 \div 6 = 2$<br>$90 + 2 = 92$<br>  <br><br><br>✅ **Pass Criteria:**<br>Student independently applies the partial quotient method step-by-step.<br>Student checks by multiplying divisor × quotient to confirm accuracy. | **Q1**<br>Mrs. Lina bought **672 notebooks** to distribute equally among **8 classrooms**. How many notebooks does each class receive?<br>👉 **Expected Answer:** 8 × 80 = 640 → 32 left → 8 × 4 = 32 → **84 notebooks per class**<br><br>**Q2**<br>Adam is dividing **729 dates** equally into **9 trays**. How many dates are in each tray?<br>👉 **Expected Answer:** $9 \times 80 = 720$ → 9 left → $9 \times 1 = 9$ → **81 dates per tray**<br><br>✅ **Pass Criteria:**<br>Student explains reasoning and can represent the division using partial quotients, area models, or equations.<br>Student verifies result using multiplication or estimation to confirm reasonableness. |

# Understand Partial Quotients

| | Towards Mastery | Mastery | Beyond Mastery |
|---|---|---|---|
| Activity Title | Bead Box Grouping | Book Distribution Task | School Canteen Division Challenge |
| Type of Activity | Hands-on / Manipulative-based | Group Work / Visual Model | Real-life Problem Solving / Reasoning |
| Summary of Activity | Students use base-ten blocks or counters to model division of 3-digit numbers by 1-digit divisors (e.g., 324 ÷ 3). Each group represents boxes of "beads" shared equally among friends. They repeatedly subtract groups of tens and ones, recording each step on paper. The teacher supports them in linking repeated subtraction to the partial quotient method.   | Working in pairs, students help Mr. Khalid distribute 432 books equally among 4 classrooms. Using drawings or area models, they represent each subtraction step and write partial quotients beside their work (e.g., 4 × 100 = 400 → 32 left). After solving, they explain their reasoning and check accuracy by multiplying divisor × quotient.   | Students tackle real-life problems such as 528 juice boxes divided among 6 student teams. They use the partial quotient strategy to divide in "chunks" (e.g., 6 × 80 = 480 → 48 left → 6 × 8 = 48). Students then present their work on mini whiteboards, explaining why different partial quotients can still yield the same result. This builds reasoning and flexibility in strategy selection. |

# Divide 4-Digit Dividends by 1-Digit Divisors

## Learning Objectives

- Use partial quotients to divide 4-digit dividends by 1-digit divisors.

| Towards Mastery | Mastery | Beyond Mastery |
|---|---|---|
| Students can divide 4-digit numbers by 1-digit divisors with teacher guidance, using repeated subtraction or visual models to find partial quotients. | Students independently divide 4-digit numbers by 1-digit divisors using the partial quotient method, keeping track of each step and verifying with multiplication. | Students explain their reasoning, compare different quotient strategies, and apply division to multi-step or contextual problems with remainders. |

## Misconceptions and Notes

Students may select inefficient partial quotients (too small or too large).
**Fix:** Encourage estimation using rounded compatible numbers to predict reasonable multiples.
Students may stop dividing when there's a remainder instead of checking divisibility.
**Fix:** Model checking divisibility and interpreting the remainder in real-life terms (e.g., leftover bottles, extra money

## Numeracy Skills

| Skill 1 | Skill 2 |
|---|---|
| **Understanding of Place Value:** Students must know how to break numbers into hundreds, tens, and ones. | **Fluency in Multiplication Facts:** Students should recall multiplication tables up to 10 for efficient partial quotient calculation. |

## Resources

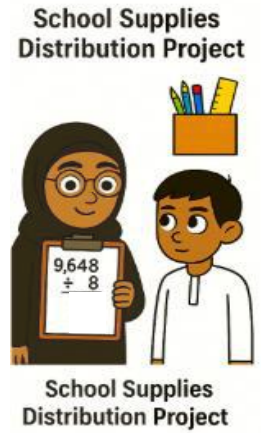
- Grade 4 Reveal Math , Teacher Edition e-Book, Volume 1 , Student Edition e-Book, Volume 1
- Game Station Resource Book – Grade 4 ( Reveal Platform ) Page 120
- Divide using place value (practice) | Khan Academy

| Domain |
|---|
| Numbers & Operations in Base Ten |
| **Standards** |
| 4.NBT.B.6 |
| **SMPs** |
| MP 7 |
| **Key Vocabulary** |
| Area<br>Model<br>Partial<br>Quotients |

# Divide 4-Digit Dividends by 1-Digit Divisors

| Towards Mastery | Mastery | Beyond Mastery |
|---|---|---|
| **Q1**<br>Divide 2,436 ÷ 4 using repeated subtraction.<br>👉 **Expected Answer:**<br>2436 – 2000 = 436 , 2000 ÷ 4 = 500<br>436 – 400 = 36 , 400 ÷ 4 = 100<br>36 – 36 = 0 , 36 ÷ 4 = 9<br>500 + 100 + 9 = 609<br><br>**Q2**<br>Mrs. Lina has 1,872 pencils to distribute equally among 3 classes. How many pencils per class?<br>👉 **Expected Answer:**<br>1872 – 1800 = 72 , 1800 ÷ 3 = 600<br>72 – 60 = 12 , 60 ÷ 3 = 20<br>12 – 12 = 0 , 12 ÷ 3 = 2<br>600 + 20 + 2 = 622<br>624 pencils per class<br><br>✅ **Pass Criteria:**<br>Student uses repeated subtraction or partial grouping to find the quotient.<br>Shows understanding that division represents equal sharing across thousands, hundreds, tens, and ones. | **Q1**<br>Solve 3,672 ÷ 6 using the partial quotient method. Show your steps.<br>👉 **Expected Answer:**<br>6 × 600 = 3,600 → 72 left → 6 × 12 = 72 → **Quotient = 612**<br><br>**Q2**<br>Aisha divides 4,248 dirhams among 8 friends equally. How much does each friend receive?<br>👉 **Expected Answer:**<br>531 dirhams per friend<br><br>✅ **Pass Criteria:**<br>Student efficiently applies the partial quotient strategy, records each subtraction step clearly, and checks accuracy using multiplication. | **Q1**<br>Mr. Khalid buys 4,350 bottles for 7 coolers. How many bottles go in each, and how many are left?<br>👉 **Expected Answer:**<br>621 bottles per cooler, 3 bottles remain<br><br>**Q2**<br>A delivery truck has 9,648 AED worth of supplies to distribute equally among 8 stores. Find the amount per store and explain your reasoning.<br>👉 **Expected Answer:**<br>1,206 AED per store; verified because 8 × 1,206 = 9,648<br><br>✅ **Pass Criteria:**<br>Student applies division flexibly to solve multi-step or contextual problems.<br>Explains reasoning and verifies the result through multiplication or estimation. |

# Divide 4-Digit Dividends by 1-Digit Divisors

| | Towards Mastery | Mastery | Beyond Mastery |
|---|---|---|---|
| Activity Title | Base-Ten Block Breakdown | Division Board Race | School Supplies Distribution Project |
| Type of Activity | Hands-on / Manipulative-Based | Collaborative / Visual Model | Real-Life / Problem Solving |
| Summary of Activity | Students use base-ten blocks to model dividing a 4-digit number such as 2,436 ÷ 4. They physically group thousands, hundreds, tens, and ones into equal sets to visualize division. The teacher guides students step-by-step to record each "chunk" as a partial quotient (e.g., 4 × 500 = 2,000).This builds conceptual understanding before moving to abstract notat   | Students work in pairs to solve problems such as 4,248 ÷ 8 on a whiteboard using the partial quotient method. Each pair races to complete the division correctly, showing all subtraction steps. Afterward, they explain how they checked their answer by multiplying divisor × quotient. This promotes accuracy, speed, and self-verification. | Students apply division to a UAE school scenario: "Mr. Khalid bought AED 9,648 worth of materials for 8 departments. How much does each receive?" They use partial quotients to calculate, check reasonableness using estimation, and explain how remainders might be interpreted (e.g., funds left for extras).This deepens their reasoning and connects math to real contexts.   |

# Understand Remainders

## Learning Objectives

- Divide multi-digit whole numbers that result in a quotient and a remainder.
- Explain what a remainder means in the context of the problem.

| Towards Mastery | Mastery | Beyond Mastery |
|---|---|---|
| Students can perform simple divisions resulting in remainders using manipulatives or visual models. They identify the remainder but may not yet connect it to the problem's meaning. | Students can divide multi-digit numbers and explain what the remainder represents in real-life situations, determining whether to use, share, or ignore it depending on context. | Students can solve multi-step word problems involving remainders and justify their interpretation using reasoning and contextual understanding. |

## Misconceptions and Notes

Students may ignore remainders after finding the quotient.
**Fix:** Emphasize real-life contexts where remainders matter (e.g., people, buses, boxes).
Students may think the remainder must always be used as part of the answer.
**Fix:** Discuss situations where remainders are **rounded up** (e.g., number of buses) or **ignored** (e.g., items that can't be split).

## Numeracy Skills

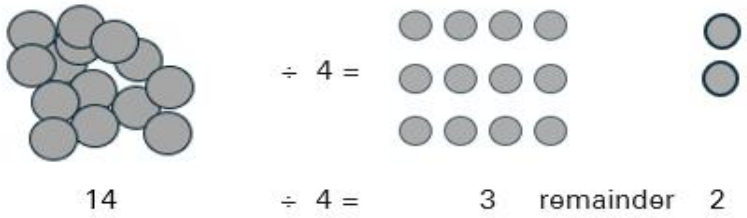
| Skill 1 | Skill 2 |
|---|---|
| **Fluency in Division Facts:** Students should confidently recall and apply basic division and multiplication facts up to 12 × 12. | **Understanding of Place Value:** Students must understand how to partition numbers into hundreds, tens, and ones when dividing. |

## Resources

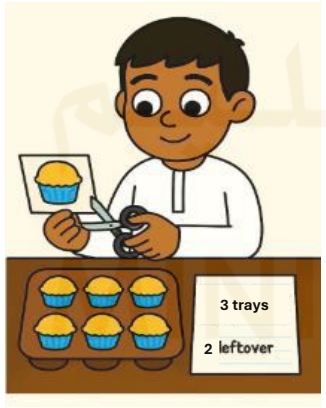
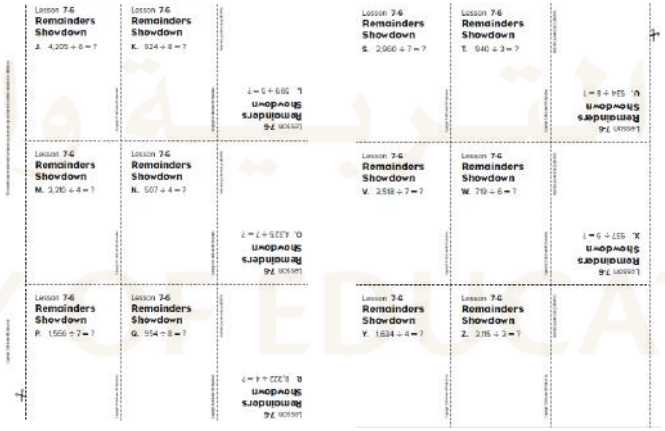
- Grade 4 Reveal Math , Teacher Edition e-Book, Volume 1 , Student Edition e-Book, Volume 1
- Game Station Resource Book – Grade 4 ( Reveal Platform ) Page 125
- Estimate to divide by 1-digit numbers (practice) | Khan Academy
- https://www.ixl.com/math/grade-4/divide-larger-numbers-by-1-digit-numbers-interpret-remainders

| Domain |
|---|
| Numbers & Operations in Base Ten |
| **Standards** |
| 4.NBT.B.6 |
| **SMPs** |
| MP 2 |
| **Key Vocabulary** |
| Remainder |

# Understand Remainders

| Towards Mastery | Mastery | Beyond Mastery |
|---|---|---|
| **Q 1**<br>Aisha has 14 dates. She wants to pack 4 dates in each box.<br>👉 **Expected Answer:** 3 full boxes and 2 dates left over.<br>  <br><br>**Q 2**<br>Adam has 19 markers to place in packs of 5.<br>👉 **Expected Answer:**<br>19 - 5 = 14<br>14 - 5 = 9<br>9 - 5 = 4<br>3 packs and 4 markers left over<br>✅ **Pass Criteria:**<br>Student can divide using concrete or visual models.<br>Student correctly identifies the remainder as what is left over. | **Q 1**<br>Mrs. Lina has 65 juice boxes to pack into crates of 8. How many crates does she fill, and how many are left?<br>👉 **Expected Answer:** 8 crates filled, 1 juice box left over.<br>**Q 2**<br>Mr. Khalid has 73 AED to distribute equally among 6 students. How much does each student get and how much money remains?<br>👉 **Expected Answer:** Each student gets 12 AED, with 1 AED remaining.<br>✅ **Pass Criteria:**<br>Student finds both quotient and remainder accurately.<br>Student explains what the remainder represents in context. | **Q 1**<br>A school has 125 students joining a museum trip. Each bus can carry 40 students. How many buses are needed?<br>👉 **Expected Answer:** 3 full buses (120 students) and 5 students left → need 4 buses in total.<br>**Q 2**<br>A shop sells 245 water bottles packed into cartons of 12. How many full cartons can they make, and what should they do with the remainder?<br>👉 **Expected Answer:** 20 cartons (240 bottles) and 5 bottles left → start a new carton.<br>✅ **Pass Criteria:**<br>Student interprets remainders appropriately based on real-life scenarios.<br>Student justifies their reasoning verbally or in writing. |

# Understand Remainders

| | Towards Mastery | Mastery | Beyond Mastery |
|---|---|---|---|
| Activity Title | Cupcake Tray Division | Remainder Challenge Card Game | School Bus Planning Task |
| Type of Activity | Hands-on / Manipulative-Based | Collaborative / Game-Based Division Practice | Real-Life Problem Solving / Reasoning |
| Summary of Activity | Students are given 20 paper cupcakes and cupcake trays with 6 spaces each. They fill as many trays as possible and identify how many cupcakes are left without a tray. Through this, they understand that the "leftover cupcakes" represent the remainder, visualizing that not all items always fit evenly into equal groups.   | Students practice division using the partial quotients method. They take turns drawing division cards, solving the problems, and comparing remainders. The player with the greatest remainder keeps the card. The game continues until all cards are used, and the student with the most cards wins. This fun, competitive activity builds fluency with division and reinforces understanding of remainders.  | Students help Mr. Khalid plan transportation for 125 students going on a field trip, with 40 seats per bus. They calculate how many buses are completely full and how many are still needed for the remaining students. Students discuss whether the remainder should be ignored, rounded up, or used to make another full group — connecting division to real decision-making.   |

# Make Sense of a Remainder

| Learning Objectives | | |
|---|---|---|
| Determine how to interpret the remainder of a division equation based on the of the problem. | | |
| **Towards Mastery** | **Mastery** | **Beyond Mastery** |
| Students identify the remainder in a division problem and recognize that it represents what is "left over" after dividing equally. | Students explain the meaning of a remainder in real-life contexts and decide whether it should be used, ignored, or rounded up depending on the situation. | Students create and solve real-world division problems that require interpreting the remainder in various ways (e.g., ignoring, rounding up, or sharing equally). |

| Misconceptions and Notes |
|---|
| Students think the remainder is always part of the answer.<br>**Fix:** Teach that sometimes we ignore or round up depending on the real-life scenario (e.g., buses vs. candy pieces).<br><br>Students forget to check the reasonableness of their interpretation.<br>**Fix:** Use questions like: "Does it make sense to have half a person or bus?" to prompt contextual reasoning |

| Numeracy Skills | |
|---|---|
| **Skill 1** | **Skill 2** |
| Understanding division as equal sharing or grouping. | Connecting remainders to real-world quantities (objects or people that cannot be divided evenly). |

| Resources |
|---|
| • Grade 4 Reveal Math , Teacher Edition e-Book, Volume 1 , Student Edition e-Book, Volume 1<br>• Game Station Resource Book – Grade 4 ( Reveal Platform ) Page 129<br>• Interpret remainders (practice) \| Division \| Khan Academy |

| Domain |
|---|
| Operations & Algebraic Thinking |
| **Standards** |
| 4.OA.A.3 |
| **SMPs** |
| MP 2 |
| **Key Vocabulary** |
| Remainder |

# Make Sense of a Remainder

| Towards Mastery | Mastery | Beyond Mastery |
|---|---|---|
| **Q1:**<br>Aisha has **22 pencils** and wants to place **5 pencils in each cup**. How many cups will she fill, and what does the remainder represent?<br>👉 **Expected Answer:** "She fills 4 cups with 2 pencils left. The remainder 2 means there are 2 pencils without a cup."<br><br>**Q2:**<br>Adam divides **17 dates** into **groups of 4**. How many full groups can he make?<br>👉 **Expected Answer:** "4 full groups with 1 date left over."<br><br>✅ **Pass Criteria:**<br>Student correctly identifies the remainder.<br>Student explains that the remainder represents the "leftover" part that doesn't fit evenly. | **Q1:**<br>Mr. Khalid is taking **38 students** to a math competition using buses that each hold **10 students**. How many buses does he need?<br>👉 **Expected Answer:** He needs 4 buses because 3 buses carry 30 students, and 8 students are left. He must add one more bus.<br><br>**Q2:**<br>Mrs. Lina has **50 cookies** and wants to put **8 in each box**. How many boxes does she need to pack all cookies?<br>👉 **Expected Answer:** She needs 7 boxes because 6 boxes hold 48 cookies and 2 cookies remain, so one more box is needed.<br><br>✅ **Pass Criteria:**<br>Student interprets the remainder according to context (round up or use one more group).<br>Student explains reasoning clearly using a real-world example. | **Q1:**<br>A school cafeteria has **38 apples** and wants to give them equally to **6 tables**. How many apples will each table get, and what can they do with the remainder?<br>👉 **Expected Answer:** Each table gets 6 apples and 2 remain. The 2 leftover apples can be shared by cutting them into equal parts.<br><br>**Q2:**<br>A sports club has **95 trophies** to place on shelves that hold **12 trophies each**. How many shelves are needed, and what happens to the remaining trophies?<br>👉 **Expected Answer:** "7 shelves fit 84 trophies; 11 trophies are left, so they need 1 more shelf for the remaining trophies."<br><br>✅ **Pass Criteria:**<br>Student creates or solves problems requiring flexible interpretation of remainders (ignore, share, or add extra).<br>Student justifies the decision in complete sentences. |

# Make Sense of a Remainder

| | Towards Mastery | Mastery | Beyond Mastery |
|---|---|---|---|
| Activity Title | Cup Sharing Challenge | Bus Trip Planning | Market Stall Remainder Reasoning |
| Type of Activity | Hands-on / Manipulative-based | Real-life Problem Solving / Visual Model | Group Discussion / Contextual Reasoning |
| Summary of Activity | Students use 20 small cups (“counters”) and try to share them equally among 3, 4, or 5 friends. They record how many each friend gets and what’s left over. The teacher prompts them to describe what the remainder represents in each case — the leftover pieces that didn’t fit evenly into groups.   | Students solve division problems involving bus seating — for example, “47 students, 10 seats per bus.” They draw pictures or use counters to model passengers on buses, determine how many buses are needed, and explain their reasoning (e.g., “The remainder means 7 students need another bus”). This connects math to real UAE school contexts.   | In teams, students create their own real-world remainder scenarios (e.g., “Sharing 65 dates among 8 baskets,” or “Packaging 37 bottles of juice into boxes of 6”). They must decide whether the remainder should be ignored, shared, or requires one more container, then justify their choice using sentences like: “Because the baskets must be full, we need one more basket.”   |

# Solve Multi-Step Problems Using Division

## Learning Objectives

- Solve multi-step word problems involving division by representing the problems using equations with a variable.

| Towards Mastery | Mastery | Beyond Mastery |
|---|---|---|
| Students can solve one-step division problems and begin to combine two simple operations (e.g., multiplication then division) with teacher guidance. | Students can independently solve multi-step problems involving division and another operation, representing their process with an equation that includes a variable. | Students can analyze complex multi-step division problems with remainders, justify their reasoning, and explain how to interpret remainders in real-life contexts. |

## Misconceptions and Notes

Students may ignore remainders or interpret them incorrectly.
**Fix**: Discuss various real-life contexts (e.g., buses, cartons, trays) and what a remainder represents (extra group, leftover, or rounding up).

## Numeracy Skills

| Skill 1 | Skill 2 |
|---|---|
| Understand the relationship between multiplication and division. | Fluency in multiplication and division |

## Resources

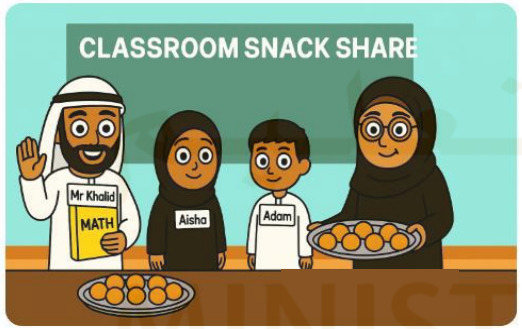
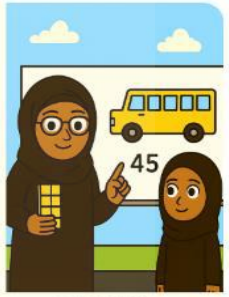
- Grade 4 Reveal Math , Teacher Edition e-Book, Volume 1 , Student Edition e-Book, Volume 1
- Game Station Resource Book – Grade 4 ( Reveal Platform ) Page 133
- Multi-step word problems with whole numbers (practice) | Khan Academy
- https://www.ixl.com/math/grade-4/divide-larger-numbers-by-1-digit-numbers-comparison-word-problems

| Domain |
|---|
| Operations & Algebraic Thinking |
| **Standards** |
| 4.OA.A.3 |
| **SMPs** |
| MPs 1 & 4 |
| **Key Vocabulary** |
| Variable |

# Solve Multi-Step Problems Using Division

| Towards Mastery | Mastery | Beyond Mastery |
|---|---|---|
| **Q1**<br>Mr. Khalid arranged 36 students into groups of 6. How many groups did he make?<br>👉 **Expected Answer:** 36 ÷ 6 = 6 groups<br><br>**Q2**<br>If in the above question each group received 4 worksheets. How many worksheets were used in total?<br>👉 **Expected Answer:** 6 × 4 = 24 worksheets<br><br>✅ **Pass Criteria:**<br>Student can perform one-step or simple two-step operations (division and multiplication) with guidance.<br>Student shows understanding of grouping and total calculation. | **Q1**<br>Aisha bought 72 juice bottles. Each pack holds 8 bottles. After giving 3 packs to her classmates, how many bottles does she still have?<br>👉 **Expected Answer:** 72 ÷ 8 = 9 packs; 9 – 3 = 6 packs → 6 × 8 = 48 bottles left<br><br>**Q2**<br>Adam has AED 120 . He wants to buy notebooks that cost AED 10 each and also spend AED 20 on pencils. How could he plan his spending so that he still has some money left?<br>👉 **Expected Answer:** 120 ÷ 10 = 12 notebooks; 12 × 10 + 20 = AED 140 spent (not possible)<br>11 notebooks × 10 = 110 + 20 =AED 130 (not possible)<br>10 notebooks × 10 = 100 + 20 = AED 120 ( possible) but nothing left<br>9 notebooks × 10 = 90 + 20 = AED 110 ( possible) and AED 10 is left<br><br>✅ **Pass Criteria:**<br>Student can independently solve and represent multi-step division problems using equations.<br>Student can check and adjust solutions for reasonableness. | **Q1**<br>Mrs. Lina is organizing a school field trip. Each bus holds 48 students. There are 230 students. How many buses are full, and how many students need a small van?<br>👉 **Expected Answer:** 230 ÷ 48 = 4 R38 → 4 full buses, 38 students need a van.<br><br>**Q2**<br>A bakery packs 250 cupcakes into boxes of 12. Each box is sold for AED 15 . How much money will they make from full boxes only?<br>👉 **Expected Answer:** 250 ÷ 12 = 20 R10 → 20 full boxes × AED 15 = AED 300<br><br>✅ **Pass Criteria:**<br>Student can interpret remainders correctly and justify their use in real-life contexts.<br>Student demonstrates reasoning through equations and clear explanations. |

# Solve Multi-Step Problems Using Division

| | Towards Mastery | Mastery | Beyond Mastery |
|---|---|---|---|
| Activity Title | Classroom Snack Share | Stationery Store Challenge | Field Trip Bus Planner |
| Type of Activity | Hands-on / Group Work | Problem-Solving / Real-Life Application | Real-World Reasoning / Collaborative Task |
| Summary of Activity | Aisha and Adam bring 36 date balls to share with their 6 classmates. Students work in small groups using counters to model how many each person gets, then record how many remain if an extra friend joins. The teacher links the model to a simple two-step equation (36 ÷ 6, then adjust for +1 friend). This builds fluency in equal grouping and introduces multi-step reasoning.   | Mr. Khalid runs a store where students purchase notebooks and pencils. Each notebook costs 8 AED, and each pencil 2 AED. Given 96 AED, students determine how many full sets of 1 notebook + 1 pencil can be bought and how much money remains,<br>So (8+2) = AED 10, now how many full sets can be bought in the given amount. This reinforces connecting division and multiplication within multi-step contexts.   Stationery Store Challenge | Mrs. Lina asks students to plan a field trip for 156 students using buses that hold 45 students each and minivans for leftovers. Teams calculate how many full buses are needed and how many students must take vans, then write a two-step equation (156 ÷ 45 = 3 R21). Students justify how to handle the remainder — whether to hire another van or adjust group sizes — promoting contextual interpretation of division.   Field Trip Bus Planner |

# Division Strategies with Multi-Digit Dividends and 1-Digit Divisors

❖ This section aims to assess how well students have mastered the module objectives upon completion of the module.

| Question Number | Question | DOK Level | Standard | SMPs |
|---|---|---|---|---|
| 1 | Compute $640 \div 8$ using basic facts and place-value reasoning. | 1 | 4.NBT.B.6 | SMP 2, 6, 7 |
| 2 | Estimate the quotient of $2{,}436 \div 6$. Explain your reasoning. | 2 | 4.NBT.B.6 | SMP 1, 2, 8 |
| 3 | Divide $4{,}368 \div 6$. Explain how you used place value to find the quotient. | 3 | 4.NBT.B.6 | SMP 1, 2, 7, 8 |
| 4 | A bus carries $45$ students. How many buses are required to carry $190$ students? (Interpret the remainder.)  | 3 | 4.OA.A.3 | SMP 1, 2, 3, 4 |
| 5 | Multi-Step: A factory packs $3{,}276$ toys into $8$ boxes equally. Each box goes to $4$ stores. How many toys go to each store?   | 4 | 4.OA.A.3 | SMP 1, 2, 4, 6, 8 |

# Fraction Equivalence

## Notes & Guidance

This unit builds on students' prior understanding of part-whole relationships and extends their knowledge to **equivalent fractions** and **fraction comparison**.
Students will explore how fractions represent the same value when multiplied or divided by the same number. The module connects **visual reasoning (area models, fraction strips, number lines)** with **numerical reasoning (multiplication and division)**.
Teachers should emphasize the **concept of "same size, different names"**—fractions can look different but represent the same quantity. Additionally, the use of **benchmarks (0, ½, 1)** supports meaningful fraction comparison and estimation.

## Key Skills

By the end of this unit, students should be able to:

- Identify and generate equivalent fractions using models.
- Multiply or divide both numerator and denominator by the same number to find equivalent fractions.
- Represent and locate equivalent fractions on number lines.
- Use benchmark fractions (0, ½, 1) to reason about fraction size.
- Compare fractions with different numerators and denominators using reasoning or equivalence.
- Justify comparisons verbally and in writing.

## Pedagogy

Teachers should provide a concrete–representational–abstract (CRA) progression:
Begin with hands-on models (fraction strips, paper folding, area models).
Transition to visual representations (number lines, diagrams).
Move toward symbolic reasoning using multiplication and division to create equivalent fractions.
Encourage student dialogue using sentence stems like: "I know these fractions are equivalent because…""When I multiplied both numerator and denominator by ___, the parts changed but the size stayed the same."
Integrate real-life UAE examples — comparing portions of date plates, water bottles, or garden plots — to make equivalence meaningful.

## International Assessment Links

### TIMSS Connection (Grade 4 – Number Domain)

TIMSS Grade 4 assesses understanding of fractions as numbers, equivalence, and comparison. Students must identify equivalent fractions using models and number lines, and apply reasoning to compare simple fractions.
This unit strengthens conceptual understanding and reasoning strategies required for TIMSS fraction comparison and equivalence tasks.

### PISA Connection (Mathematical Literacy – Quantity & Change)

Although PISA starts at age 15, this unit lays early groundwork for PISA's focus on **proportional reasoning and quantitative relationships**.
*By developing the ability to recognize equivalence and reason with fractions as quantities, students build a foundation for real-world proportional and ratio reasoning assessed in PISA.*

# Fraction Equivalence

- This section aims to identify the fundamental knowledge and skills that students already possess before starting the module, as well as any areas that may need support or review to strengthen new learning. Teachers can use this section to conduct a quick check of

| Question Number | Question | DOK Level | Standard | SMPs |
|---|---|---|---|---|
| 1 | Shade $\frac{1}{2}$ of a rectangle. How many equal parts must you make? | 1 | 3.NF.A.1 (review) | SMP 1, 4, 6 |
| 2 | Identify two fractions that are equal to $\frac{1}{2}$ from this set: $\frac{1}{3}$, $\frac{2}{4}$, $\frac{2}{3}$, $\frac{5}{10}$. | 1 | 4.NF.A.1 | SMP 2, 7, 8 |
| 3 | Use multiplication to make an equivalent fraction for $\frac{1}{3}$. | 2 | 4.NF.A.1 | SMP 2, 7, 8 |
| 4 | Draw a number line from 0 to 1 and show $\frac{1}{4}$ and $\frac{1}{2}$. Which is greater   | 2 | 4.NF.A.2 | SMP 1, 4, 5, 6 |
| 5 | Which fraction is closest to 1 whole: $\frac{3}{4}$, $\frac{4}{5}$, $\frac{1}{2}$ ? Explain. | 3 | 4.NF.A.2 | SMP 1, 2, 3 |

# Module 8 – Fraction Equivalence
# Learning Objectives and Standards

| Standards | Learning Objectives | | Formative Assessment Criteria |
|---|---|---|---|
| 4.NF.A.1 Explain why a fraction a/b is equivalent to a fraction (n × a)/(n × b) by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions.<br><br>4.NF.A.2 Compare two fractions with different numerators and different denominators, e.g., by creating common denominators or numerators, or by comparing to a benchmark fraction such as $\frac{1}{2}$. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model. | L1 | • Use fraction models to recognize equivalent fractions and explain their equivalence by reasoning about the number of parts in the fraction and the number of parts in the whole. | • Shade two rectangles: one divided into 2 equal parts (shade 1), another into 4 equal parts (shade 2). Ask: Are the shaded parts equal? Explain how you know. |
| | L2 | • Use multiplication and division to generate equivalent fractions. | • Write a fraction equivalent to $\frac{3}{5}$ by multiplying or dividing both numerator and denominator by the same number. |
| | L3 | • Use number line representations with different intervals and use multiplication and division to generate equivalent fractions. | • Mark $\frac{1}{2}$ and $\frac{2}{4}$ on a number line divided into fourths. Ask: What do you notice about their positions? |
| | L4 | • Compare two fractions using the benchmark numbers 0, $\frac{1}{2}$, and 1. | • Which is closer to 1, $\frac{3}{8}$ or $\frac{5}{8}$? Explain your reasoning. |
| | L5 | • Compare two fractions by generating equivalent fractions with like numerators or like denominators. | • Compare $\frac{2}{3}$ and $\frac{3}{4}$ by creating equivalent fractions with a common denominator. |

| Notes |
|---|
| • The Instructional Planner (IPs) and Scope & Sequence are available on the LMS Platform.<br>• Grade 4 Teacher Edition Book – MINHAJI |

# Equivalent Fractions

## Learning Objectives

- Use fraction models to recognize equivalent fractions and explain their equivalence by reasoning about the number of parts in the fraction and the number of parts in the whole.

| Towards Mastery | Mastery | Beyond Mastery |
|---|---|---|
| Students can use visual fraction models (like fraction strips or shaded shapes) to identify simple equivalent fractions (e.g., $\frac{1}{2} = \frac{2}{4}$), when models are provided. | Students independently create fraction models to show equivalence and can explain why two fractions are equal by comparing the size and number of parts. | Students generate equivalent fractions using multiplication or division and justify their reasoning with models or equations. They can apply this understanding to real-life contexts. |

## Misconceptions and Notes

Students may think fractions with different numerators and denominators cannot be equal.
**Fix:** Use visual models like fraction walls or folding paper to show equal areas with different labels (e.g., $\frac{1}{2} = \frac{2}{4}$).
Students may focus only on the numbers and ignore the relationship between parts and the whole.
**Fix:** Reinforce that equivalent fractions must represent the same amount of the same-sized whole.

## Numeracy Skills

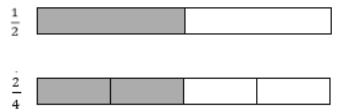
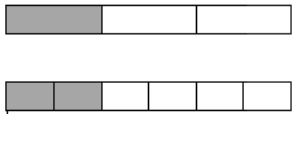
| Skill 1 | Skill 2 |
|---|---|
| **Understanding of Partitioning:** Ability to divide shapes or sets into equal parts. | **Knowledge of Multiplication & Division Relationships:** Understanding that multiplying or dividing both numerator and denominator by the same number maintains the same ratio. |

## Resources

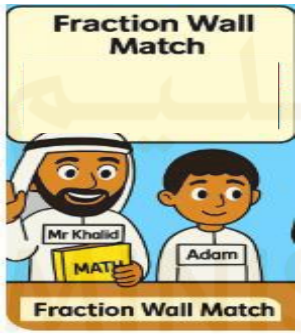
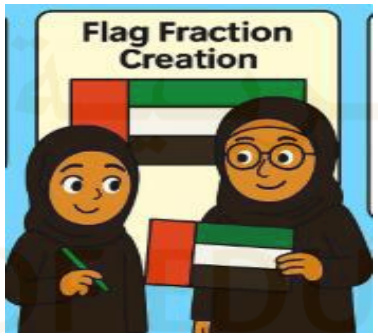
- Grade 4 Reveal Math , Teacher Edition e-Book, Volume 2 , Student Edition e-Book, Volume 2
- Game Station Resource Book – Grade 4 ( Reveal Platform ) Page 135
- Equivalent fractions (number lines) (practice) | Khan Academy
- https://www.ixl.com/math/grade-4/identify-equivalent-fractions-using-number-lines

| Domain |
|---|
| Numbers & Operations - Fractions |
| **Standards** |
| 4.NF.A.1 |
| **SMPs** |
| MP 7 |
| **Key Vocabulary** |
| Equivalent Fractions |

# Equivalent Fractions

| Towards Mastery | Mastery | Beyond Mastery |
|---|---|---|
| **Q1:**<br>Aisha shades $\frac{1}{2}$ of a chocolate bar. Adam shades $\frac{2}{4}$ of the same-size bar. Are the shaded parts equal?<br>👉 **Expected Answer:** Yes, both show the same amount because $\frac{1}{2} = \frac{2}{4}$.<br>  <br>**Q2:**<br>Color the same amount on two fraction strips labeled $\frac{1}{3}$ and $\frac{2}{6}$. What do you notice?<br>👉 **Expected Answer:** They cover the same length $\frac{1}{3} = \frac{2}{6}$.<br>  <br>✅ **Pass Criteria:**<br>Student identifies that fractions can look different but represent the same quantity.<br>Student uses models or reasoning to justify the equality. | **Q1:**<br>Mr. Khalid shows $\frac{3}{6}$ of a UAE flag shaded. Write an equivalent fraction using the smallest numbers possible.<br>👉 **Expected Answer:** $\frac{1}{2}$ because both represent half the flag.<br>**Q2:**<br>Aisha cuts an orange into 8 equal slices and eats 4 slices. Adam cuts another orange into 4 pieces and eats 2. Who ate more?<br>👉 **Expected Answer:** They ate the same amount since $\frac{4}{8} = \frac{2}{4}$.<br>✅ **Pass Criteria:**<br>Student can generate equivalent fractions by dividing or simplifying numerators and denominators.<br>Student can explain using visual or logical reasoning. | **Q1:**<br>Mrs. Lina writes $\frac{2}{3} = \frac{?}{9}$ on the board. Fill in the missing number and explain how you found it.<br>👉 **Expected Answer:** $\frac{6}{9}$, because multiplying both numerator and denominator by 3 keeps the fraction equivalent.<br>**Q2:**<br>During a Math fair, students find that $\frac{3}{5}$ of one team's area equals $\frac{6}{10}$ of another. Explain how you know these are equivalent fractions.<br>👉 **Expected Answer:** $3 \times 2 = 6$ and $5 \times 2 = 10$; both represent the same part of the whole.<br>✅ **Pass Criteria:**<br>Student correctly applies multiplication or division to find equivalent fractions.<br>Student provides reasoning or model-based justification for equivalence. |

# Equivalent Fractions

| | Towards Mastery | Mastery | Beyond Mastery |
|---|---|---|---|
| Activity Title | Fraction Wall Match | Flag Fraction Creation | Recipe Fraction Challenge |
| Type of Activity | Hands-on / Manipulative-based | Creative / Group Work | Real-life Application / Problem Solving |
| Summary of Activity | Students use printed or digital fraction wall cards showing different unit fractions ($\frac{1}{2}$ , $\frac{2}{4}$, $\frac{3}{6}$, $\frac{4}{8}$, etc.). Working in pairs, they match cards that cover the same length on the wall to visually identify equivalent fractions. Khalid guides discussion by asking: "What do you notice about the number of pieces and their sizes?" This helps learners see that as the number of parts increases, each part gets smaller but still represents the same amount of the whole.   | In small groups, students design mini- flags ( Rectangles ) divided into equal sections (e.g., halves, thirds, sixths). They color different portions to show pairs of equivalent fractions, such as $\frac{2}{4} = \frac{1}{2}$ or $\frac{3}{6} = \frac{1}{2}$. Each group explains how their design represents equivalent fractions using multiplication or division reasoning. This visual and patriotic context supports reasoning about numerator-denominator relationships.   | Students are given a traditional luqaimat recipe that serves 4 people. They must adjust it to serve 8 and explain how ingredient amounts form equivalent fractions (e.g., $\frac{1}{4}$ cup → $\frac{2}{8}$ cup). After calculating, students justify how multiplying both numerator and denominator creates an equivalent amount, connecting math to cultural cooking traditions and proportional reasoning.   |

# Generate Equivalent Fractions using Models

## Learning Objectives

- Use multiplication and division to generate equivalent fractions.

| Towards Mastery | Mastery | Beyond Mastery |
|---|---|---|
| Students can identify simple equivalent fractions using visual models (e.g., shaded rectangles or circles) and recognize that multiplying or dividing both numerator and denominator by the same number creates an equivalent fraction. | Students can generate equivalent fractions by multiplying or dividing both numerator and denominator using fraction bars or number lines and can justify their reasoning verbally or in writing. | Students can independently use multiplication and division to generate multiple equivalent fractions and explain relationships among them using models and abstract reasoning. |

## Misconceptions and Notes

Students may only look at the numbers, not the relationship between numerator and denominator.
**Fix:** Emphasize using visual models first to show that equivalence is based on proportion, not identical numbers.
Students may multiply or divide only one part of the fraction (numerator or denominator).
**Fix:** Model that both numerator and denominator must change together to keep the fraction's value the same.

## Numeracy Skills

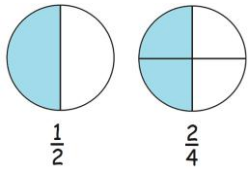
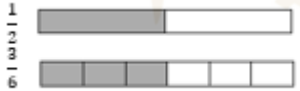
| Skill 1 | Skill 2 |
|---|---|
| **Understanding of Multiplication and Division Relationships:** Students should know how to apply multiplication or division equally to both parts of a fraction. | **Recognizing Fraction Models and Parts of a Whole:** Students must interpret visual models (bars, circles, or grids) and connect them to numerical fractions. |

## Resources

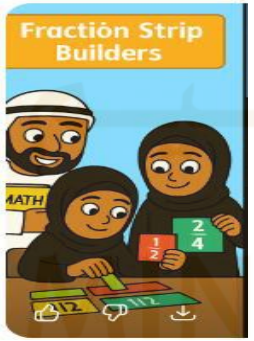
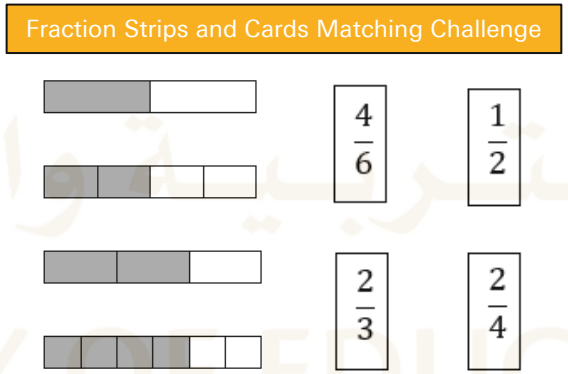
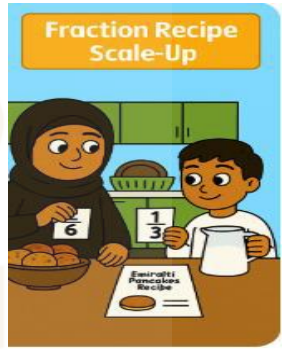
- Grade 4 Reveal Math , Teacher Edition e-Book, Volume 2 , Student Edition e-Book, Volume 2
- Game Station Resource Book – Grade 4 ( Reveal Platform ) Page 137
- Equivalent fractions (fraction models) (practice) | Khan Academy
- https://www.ixl.com/math/grade-4/find-equivalent-fractions-using-area-models

| Domain |
|---|
| Numbers & Operations - Fractions |
| **Standards** |
| 4.NF.A.1 |
| **SMPs** |
| MP 4 |
| **Key Vocabulary** |
| Denominator<br>Equivalent Fractions<br>Numerator |

# Generate Equivalent Fractions using Models

| Towards Mastery | Mastery | Beyond Mastery |
|---|---|---|
| **Q1:**<br>Aisha shades $\frac{1}{2}$ of a circle. Adam shades $\frac{2}{4}$ of the same-size circle, who shaded more ?<br>👉 **Expected Answer:**<br>Both shaded the same amount; $\frac{1}{2} = \frac{2}{4}$ .<br>  <br>$\frac{1}{2}$ $\frac{2}{4}$<br>**Q2:**<br>If Mrs. Lina shades $\frac{3}{6}$ of a rectangle and Mr. Khalid shades $\frac{1}{2}$ of a same-size rectangle, are they showing the same fraction?<br>👉 **Expected Answer:** Yes, because $\frac{1}{2}$ and $\frac{3}{6}$ represent the same part of the whole.<br>  <br>✅ **Pass Criteria:**<br>Student correctly identifies visually equivalent fractions.<br>Student can explain that equal parts represent the same portion of the whole. | **Q1:**<br>Using fraction bars, show a fraction equal to $\frac{2}{3}$ by multiplying both numerator and denominator by 2.<br>👉 **Expected Answer:** $\frac{2}{3} = \frac{4}{6}$.<br>**Q2:**<br>Draw a rectangle divided into 5 equal parts, shade 3 parts, and then divide each part into two smaller parts. What new equivalent fraction did you create?<br>👉 **Expected Answer:** $\frac{3}{5} = \frac{6}{10}$.<br>✅ **Pass Criteria:**<br>Student multiplies or divides both numerator and denominator by the same number.<br>Student uses models or reasoning to show how the fractions are equivalent. | **Q1:**<br>Mr. Khalid says $\frac{1}{2}$ , $\frac{2}{4}$ , and $\frac{4}{8}$ are all equivalent. Explain why this is true using multiplication reasoning.<br>👉 **Expected Answer:** Because multiplying numerator and denominator by the same factor (×2, ×4) keeps the value same.<br>**Q2:**<br>Adam finds that $\frac{3}{5}$, $\frac{6}{10}$, and $\frac{9}{15}$ are equivalent. How can he use division to prove they are the same?<br>👉 **Expected Answer:** By dividing numerator and denominator of $\frac{6}{10}$ by 2 and $\frac{9}{15}$ by 3, he gets $\frac{3}{5}$.<br>✅ **Pass Criteria:**<br>Student explains reasoning using both multiplication and division.<br>Student connects numerical patterns to visual fraction equivalence. |

# Generate Equivalent Fractions using Models

| | Towards Mastery | Mastery | Beyond Mastery |
|---|---|---|---|
| Activity Title | Fraction Strip Builders | Fraction Strips and Cards Matching Challenge | Fraction Recipe Scale-Up |
| Type of Activity | Hands-on / Manipulative-Based | Visual / Collaborative Group Work | Real-Life Problem Solving / Reasoning |
| Summary of Activity | Students use colored paper strips or fraction tiles to create different fractions that represent the same amount. For example, they fold a strip into halves, then quarters, and compare $\frac{1}{2}$ and $\frac{2}{4}$ visually. Khalid guides discussion by asking: "What happens to the number of pieces when we fold again? "This helps learners grasp that as the number of parts increases, the size of each part decreases, but the total remains equal   | Students work in groups to match fraction strips with corresponding fraction cards such as $\frac{1}{2}$, $\frac{2}{4}$, $\frac{3}{6}$, and $\frac{4}{8}$. Each group explains which fractions are equivalent and how multiplication or division connects them.   | Students are given a traditional Emirati recipe for 4 people (e.g., luqaimat or pancakes). They must scale up the recipe for 8 or 12 people, adjusting ingredient amounts (e.g., $\frac{1}{3}$ cup → $\frac{2}{6}$ cup).They write equations showing how they used multiplication or division to create equivalent fractions. Aisha and Adam present their reasoning, connecting cultural relevance with mathematical understanding.   |

# Generate Equivalent Fractions using Number Lines

## Learning Objectives

- Use number line representations with different intervals and use multiplication and division to generate equivalent fractions.

| Towards Mastery | Mastery | Beyond Mastery |
|---|---|---|
| Students can identify simple fractions on a number line and recognize halves or quarters, but struggle to generate or explain equivalence using multiplication or division. | Students can generate equivalent fractions using multiplication or division and correctly represent them on number lines with different intervals. | Students can independently apply the concept of equivalence to solve real-world problems and justify their reasoning with visual and numerical representations. |

## Misconceptions and Notes

Misconceptions
- Students believe that larger denominators mean larger fractions.
- Students mark unequal intervals on number lines.

Teacher Notes
- Emphasize visual reasoning: Show on number lines that more divisions mean smaller parts.
- Reinforce equal partitioning using rulers, grid lines, or digital fraction tools.

## Numeracy Skills

| Skill 1 | Skill 2 |
|---|---|
| Understands part-whole relationships in fractions. | Can label unit fractions on a number line from 0 to 1. |

## Resources

Grade 4 Reveal Math Course 2, Teacher Edition e-Book, Volume 2
Math Worksheets

## Domain

Numbers & Operations - Fractions

## Standards

4.NF.A.1 Explain why a fraction a/b is equivalent to a fraction (n × a)/(n × b) by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions.

## SMPs

MP 4

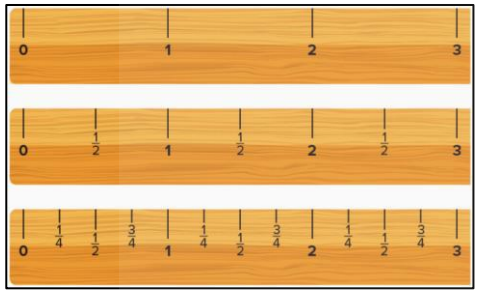
## Key Vocabulary

equivalent fractions
denominator
numerator

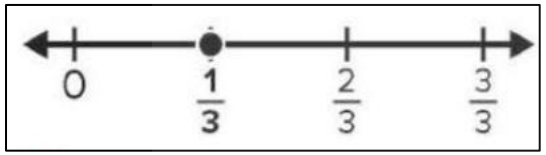
# Generate Equivalent Fractions using Number Lines

## Towards Mastery

1) What do you notice in the diagram below?



2) Which fraction is equivalent to the given point?




*a)* $\frac{1}{6}$

*b)* $\frac{2}{6}$

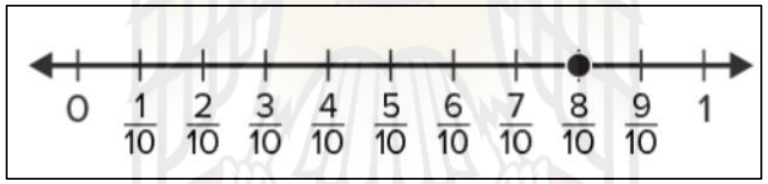
*c)* $\frac{3}{6}$

*d)* $\frac{4}{6}$

✅ **Pass Criteria:**
Can mark and label basic fractions on a number line (e.g., $\frac{1}{2}$, $\frac{1}{4}$) but cannot yet generate equivalent fractions.

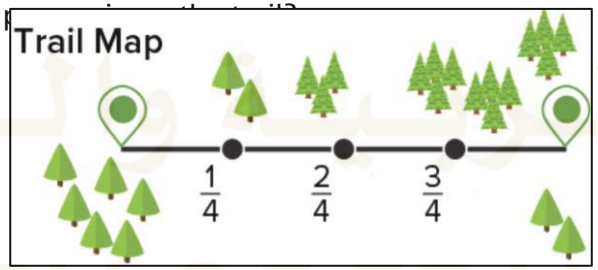
## Mastery

1) What fraction is equivalent to $\frac{8}{10}$? Use the number line and multiplication or division to explain your




2) Layla hiked $\frac{9}{12}$ kilometers on a trail. Aamira hiked $\frac{1}{2}$ kilometers on the same trail.

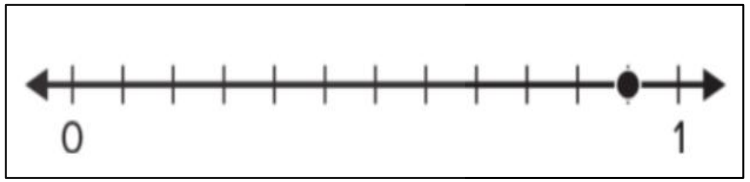
Using the diagram below, can you determine where each p




✅ **Pass Criteria:**
Accurately generate and labels at least two sets of equivalent fractions on number lines and explains how the fractions are equivalent.

## Beyond Mastery

1) Nayla placed the point on the number line for $\frac{3}{4}$ . Do you agree with Nayla? Explain why or why not.

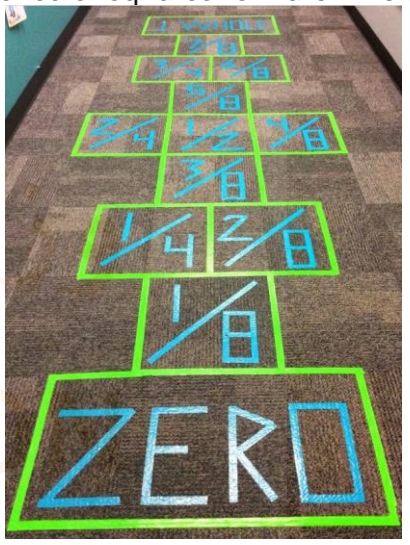



2) Give two fractions that are equivalent of four sixths?

3) What patterns did you notice when you found equivalent fractions using the number line?

✅ **Pass Criteria:**
Generate equivalent fractions across contexts, justifies reasoning verbally and visually, and connects to real-world use.

# Generate Equivalent Fractions using Number Lines

| | Towards Mastery | Mastery | Beyond Mastery |
|---|---|---|---|
| Activity Title | Fraction Clay | Sticky Notes Fraction | Fraction Hopscotch |
| Type of Activity | Manipulative-based and visual | Manipulative-based and visual | Real-life application, group project |
| Summary of Activity | Provide clay in various colors and a set of fraction cards. Guide the learner to shape the clay into a whole circle, rectangle, or other forms, and then divide it into parts<br>Students represent the fractions using clay on to a number line.<br>  | Draw a large shape like a circle, square, or rectangle on a piece of paper or board, representing a “whole.” Divide the shape into equal parts corresponding to the fractions, and have the learner place the sticky notes on the correct sections.<br>For added variety, use multiple shapes to represent different wholes or combine fractions to make a whole.<br>Students represent the fractions using clay on to a<br>  | Use chalk to draw a hopscotch grid on the ground or create one indoors using tape. Label each square with fractions, such as 1/2, 1/4, or 3/4. Provide the learner with fraction problems, like “Hop to 1/2” or “Combine fractions to make a whole.” The learner hops to the correct square or sequence of squares to match the answer.<br>  |

# Compare Fractions using Benchmarks

## Learning Objectives

- Compare two fractions using the benchmark numbers 0, $\frac{1}{2}$, and 1.

| Towards Mastery | Mastery | Beyond Mastery |
|---|---|---|
| Students demonstrate a developing understanding of comparing fractions using benchmarks but may rely on visual aids or partial reasoning. They can identify if a fraction is less than, close to, or greater than ½ when denominators are familiar. | Students accurately compare two fractions using benchmarks (0, ½, 1) and justify reasoning with or without visual models. They understand how numerators and denominators influence closeness to benchmarks. | Students generalize their understanding to compare fractions with different denominators efficiently using benchmarks without models. They apply reasoning to real-life and abstract contexts, explaining their strategies clearly. |

## Misconceptions and Notes

Misconceptions
- Students believe larger denominator mean a larger fraction.
- Students struggle to visualize benchmarks.

Teacher Notes
- Use visual fraction bars or circles to show that 1/8 is smaller than 1/4.
- Model fractions on a number line and real-life contexts (food, containers, sports distances).

## Numeracy Skills

| Skill 1 | Skill 2 |
|---|---|
| Understands part-whole relationships in fractions. | Can label unit fractions on a number line from 0 to 1. |

## Resources

Grade 4 Reveal Math Course 2, Teacher Edition e-Book, Volume 2
Mathworksheets4kids

## Domain

Numbers & Operations - Fractions

## Standards

4.NF.A.2 Compare two fractions with different numerators and different denominators, e.g., by creating common denominators or numerators, or by comparing to a benchmark fraction such as $\frac{1}{2}$. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model.

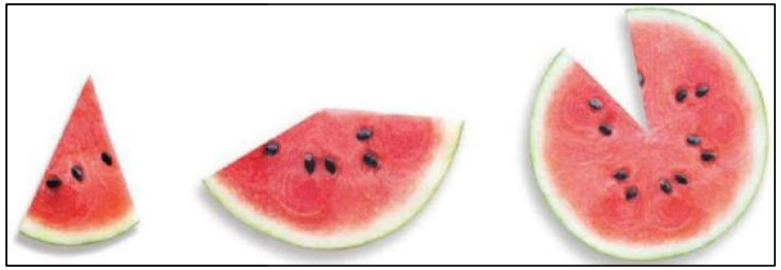
## SMPs

MP 7

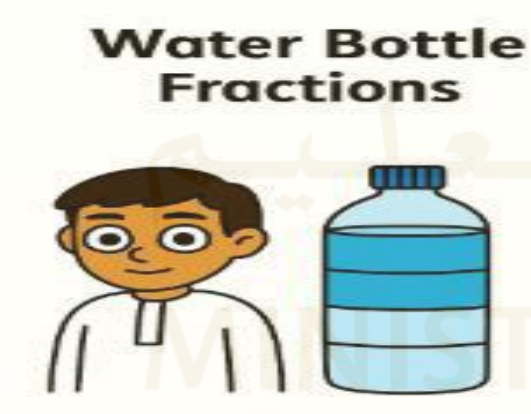
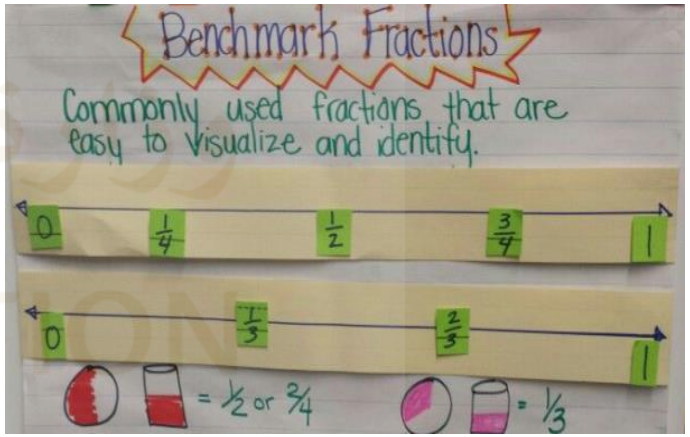
## Key Vocabulary

benchmark fraction
denominator
numerator

# Compare Fractions using Benchmarks

| Towards Mastery | Mastery | Beyond Mastery |
|---|---|---|
| 1) What do you notice in the diagram below?<br>  <br>2) There is an Iftar gathering in the month of Ramadan. The dates are shared in a plate.<br>Is $\frac{1}{3}$ of the plate of dates less or more than $\frac{1}{2}$ a plate of dates?<br>3) One bottle is $\frac{2}{5}$ full, another is $\frac{3}{5}$ full. Which bottle has more water?<br>✅ **Pass Criteria:**<br>Students can place fractions correctly around 0, $\frac{1}{2}$, and 1 on a number line with visual support.<br>Students can identify which of two simple fractions (like $\frac{1}{3}$ and $\frac{3}{4}$) is closer to $\frac{1}{2}$. | 1) One car used $\frac{4}{10}$ of its fuel in the tank and another car has used $\frac{3}{8}$. The size of the tanks are the same size. Which car used more fuel?<br>  <br><br>2) Sara drank $\frac{5}{8}$ of her juice, and Ali drank $\frac{2}{4}$. Who drank more juice?<br>  <br>✅ **Pass Criteria:**<br>Correctly determine whether a fraction is less than, equal to, or greater than $\frac{1}{2}$.<br>Justify comparisons using number lines, benchmark reasoning, or mental estimation. | 1) A recipe suggests that you need $\frac{3}{5}$ cup of milk and $\frac{2}{3}$ cup of flour.<br>Which ingredient is used more, and how do you know without finding common denominators?<br>2) Camel A ran $\frac{5}{6}$ of a lap, Camel B ran $\frac{4}{5}$. Which camel ran farther?<br>Can you use benchmarks to justify comparisons?<br>  <br>3) Zara and Amiri are each doing the same puzzle. Zara finished $\frac{10}{12}$ of her puzzle. Amiri finished $\frac{5}{8}$ of her puzzle. Did Zara finish more or less of the puzzle than Amiri? Explain your reasoning.<br>✅ **Pass Criteria:**<br>Compare fractions accurately without visual aids.<br>Use logical reasoning involving benchmarks to justify comparisons. |

# Compare Fractions using Benchmarks

| | Towards Mastery | Mastery | Beyond Mastery |
|---|---|---|---|
| Activity Title | Fraction Water Bottles | Recipe challenge | Fraction Estimation with Food |
| Type of Activity | Hands-on / Manipulative-based | Group Work / Real-Life Context | Real-Life Application |
| Summary of Activity | Provide clear plastic bottles filled to different fractions (e.g., $\frac{1}{4}$ , $\frac{1}{2}$ , $\frac{3}{4}$ ). Students label and order bottles from least to greatest based on water level, using $\frac{1}{2}$ as a benchmark.<br><br>Students will develop visual understanding of fractions relative to $\frac{1}{2}$.<br><br>  | Students have to use the fraction benchmarks to create recipes. They discuss which food item will need “more than half” or “less than third” of ingredients. Groups justify their reasoning using fraction number lines or benchmark logic using the image of the poster below.<br><br>Students will reinforce reasoning using contextual comparisons<br><br>  | Students play a role-play where they estimate how much of different supplies (juice, fuel, snacks) are left in terms of fractions and justify whether each is less or more than $\frac{1}{2}$ or close to 1. They must explain reasoning without models, focusing on efficiency and justification.<br><br>Students will apply benchmark reasoning flexibly and explain thinking clearly.<br><br>  |

# Other Ways to Compare Fractions

## Learning Objectives

- Compare two fractions by generating equivalent fractions with like numerators or like denominators.

| Towards Mastery | Mastery | Beyond Mastery |
|---|---|---|
| Students can identify when two fractions have unlike numerators or denominators and can attempt to make them alike but may make calculation or reasoning errors. | Students can accurately compare two fractions by creating equivalent fractions with like denominators or numerators and correctly identify which fraction is greater or smaller. | Students can flexibly use multiple strategies (common denominator, numerator, benchmarks, number lines) to compare fractions and can apply reasoning to real-life or word problems. |

## Misconceptions and Notes

Misconceptions

- Students may think that a larger denominator means larger fraction (e.g., believing $\frac{1}{8} > \frac{1}{4}$).
- Students may confuse the meaning of equivalent fractions.

Teacher Notes

- Use visual fraction strips or circle models to demonstrate that larger denominators mean smaller parts.
- Reinforce that equivalent fractions represent the same value on a number line, even if numerators/denominators differ.

## Numeracy Skills

| Skill 1 | Skill 2 |
|---|---|
| Understands part-whole relationships in fractions. | Can label unit fractions on a number line from 0 to 1. |

## Resources

Grade 4 Reveal Math Course 2, Teacher Edition e-Book, Volume 2
Khan Academy

## Domain

Numbers & Operations - Fractions

## Standards

4.NF.A.2 Compare two fractions with different numerators and different denominators, e.g., by creating common denominators or numerators, or by comparing to a benchmark fraction such as $\frac{1}{2}$. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model.

## SMPs

MPs 2 & 5

## Key Vocabulary

equivalent fractions
like denominators
like numerators

# Other Ways to Compare Factions

## Towards Mastery

1) Here are some designs of a few gardens.
a) How are they similar?
b) How are they different?

2) Compare the following fractions and order them from smallest to biggest: $\frac{2}{3}$ , $\frac{3}{4}$, $\frac{4}{5}$.

✅ **Pass Criteria:**

Students can correctly make one of the two fractions equivalent but not complete or accurate comparison. Demonstrate partial procedural understanding.

## Mastery

1) Nasir and Zahra have the same number of raffle tickets to sell.
Nasir sold $\frac{2}{5}$ of his raffle tickets. Zahra sold $\frac{1}{6}$ of her raffle tickets. Who sold more tickets?

2) Amir made two pasta dishes. The table shows how much cheese and sauce he used in the dishes.

| Ingredient | Amount |
|---|---|
| Parmesan Cheese | $\frac{3}{4}$ cup |
| Mozzarella Cheese | $\frac{5}{8}$ cup |
| Marinara Sauce | $\frac{2}{3}$ liter |
| Meat Sauce | $\frac{4}{5}$ liter |

a) How can you compare the amounts of cheese he used?
b) How can you compare the amounts of sauce he used?

✅ **Pass Criteria:**

Students can accurately find equivalent fractions and gives a correct comparison using >, <, or = with clear

## Beyond Mastery

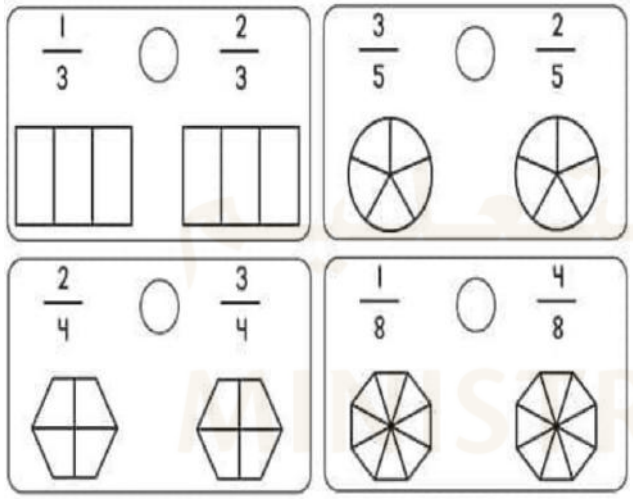
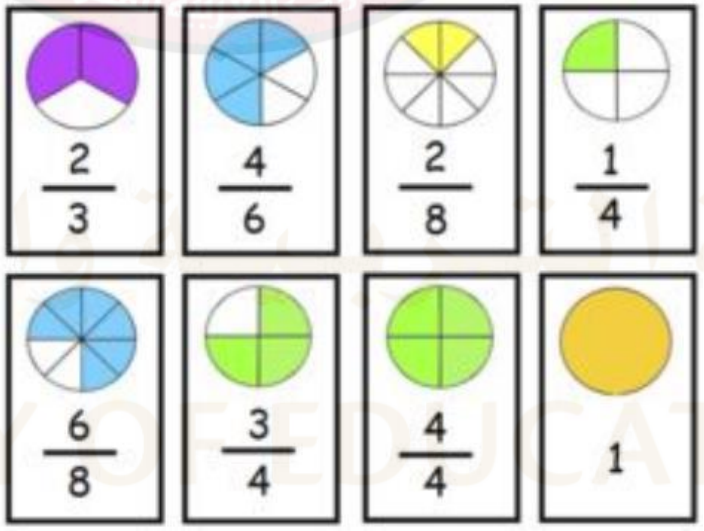
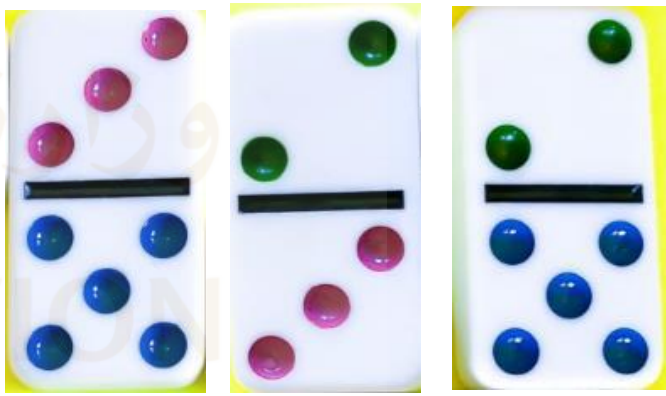
1) Hanna ate $\frac{3}{4}$ of a small apple. Her brother ate $\frac{7}{12}$ of a large apple. Hannah says she ate more than her brother because $\frac{3}{4} = \frac{9}{12}$
How would you respond to Hannah?

2) Omar compares $\frac{4}{10}$ and $\frac{8}{12}$ by finding equivalent fractions. Aisha compares the same fractions using a benchmark fraction.
Which strategy do you think is more efficient to compare the fractions?

✅ **Pass Criteria:**

Students can accurately find equivalent fractions and give a correct comparison using >, <, or = with clear reasoning.

# Other Ways to Compare Factions

| | Towards Mastery | Mastery | Beyond Mastery |
|---|---|---|---|
| Activity Title | Fraction Match-Up | Color and Compare | Dominoes Fractions |
| Type of Activity | Manipulative-Based | Hands-on / Group Work | Group hands-on |
| Summary of Activity | Students color the diagrams with the fractions provided and compare fractions.<br><br>Students can also use cubes to represent physical towers that match the fractions along with the colored diagrams.<br><br>  | Students receive cards with different fractions. They work in teams to match pairs of fractions that can be made equivalent using multiplication or division (e.g., $\frac{1}{2}$ and $\frac{2}{4}$).<br><br>  | Have students pick a domino. Ask them to count the dots on each side and write a proper fraction that represents the domino.<br>Students will work in groups and compare their fractions recorded using the dominoes. They will need to justify which fraction is bigger than the other.<br><br>  |

# Fraction Equivalence

❖ This section aims to assess how well students have mastered the module objectives upon completion of the module.

| Question Number | Question | DOK Level | Standard | SMPs |
|---|---|---|---|---|
| 1 | Write two fractions equal to $\frac{2}{5}$ using multiplication. | 1 | 4.NF.A.1 | SMP 2, 6, 8 |
| 2 | Using a model, show that $\frac{3}{9} = \frac{1}{3}$. Explain how the model proves it.. | 2 | 4.NF.A.1 | SMP 1, 4, 6 |
| 3 | Use multiplication to show that $\frac{3}{5} = \frac{6}{10}$. Then use division to explain why the fractions are equal. | 3 | 4.NF.A.1 | SMP 1, 2, 6, 7, 8 |
| 4 | Noura says that $\frac{2}{3} < \frac{3}{5}$ because 5 is bigger than 3. Explain her error and correct it. | 3 | 4.NF.A.2 | SMP 1, 2, 3, 6 |
| 5 | Multi-Step Problem: Aisha ate $\frac{3}{6}$ of a cake, and Hamad ate $\frac{4}{8}$ of a cake of the same size.<br>Who ate more? Explain your answer in two ways. | 4 | 4.NF.A.1 & 4.NF.A.2 | SMP 1, 2, 3, 4, 6 |

# Addition and Subtraction Meanings and Strategies with Fractions

## Notes & Guidance

In this unit, students work with unit fractions to create and take apart non-unit fractions. They will determine that like denominators are needed to compose and decompose fractions.
To add or subtract fractions, students need a strong understanding of the terms numerator and denominator. When students decompose fractions into unit fractions, and then add or subtract the unit fractions, they apply the meanings of numerator and denominator.
Students will utilize number lines and fraction models to compose and decompose fractions. It is important for students to have a strong conceptual understanding that the denominators must be the same in order to add or subtract fractions. To help students gain fluency with this concept, fraction tiles and number lines are efficient tools to help students understand that it only makes sense to add or subtract fractions if they have like denominators.

## Pedagogy

- Use concrete manipulatives (fraction strips, fraction circles, paper folding) for students to model addition and subtraction with common denominators, then move to visualizing unlike denominators via re-partitioning.
- Employ number lines: mark fractions, ask students to visualize remainder or sum in that domain.
- Think-pair-share: present a fraction addition/subtraction problem (e.g., $\frac{3}{4} + \frac{1}{8}$), students individually choose a strategy, then pair to compare, then share with class how their strategy works and why.
- Strategy gallery: students create posters of strategies (common-denominator, unit-fraction reasoning, number-line jumps, benchmark to one whole) and present to class.
- Real-life problem contexts: Encourage students to choose whether to subtract or add in context, and to justify.

## Key Skills

- Recognize a fraction as a number on the number line and as part of a whole or collection.
- Understand addition and subtraction of fractions as combining or removing parts of the same sized partition or equivalent sized partitions.
- Find equivalent fractions when denominators differ and use that to perform addition or subtraction.
- Add and subtract fractions with like denominators and within one whole.
- Subtract a fraction from one whole and interpret the result.
- Choose and carry out appropriate strategies (visual model, unit-fraction reasoning, number line, estimation) and reflect on their effectiveness.

## International Assessment Links

IEA TIMSS

**Number**

Recognize fractions as parts of wholes or collections; represent fractions using words, numbers, or models; compare and order simple fractions; add and subtract simple fractions, including those set in problem situations.

PISA

**Quantity (Mathematical Literacy)**

Understanding numbers, measurement, magnitude, partitions, units, and their relationships.

# Addition and Subtraction Meanings and Strategies with Fractions

❖ This section aims to identify the fundamental knowledge and skills that students already possess before starting the module, as well as any areas that may need support or review to strengthen new learning. Teachers can use this section to conduct a quick check of

| Question Number | Question | DOK Level | Standard | SMPs |
|---|---|---|---|---|
| 1 | Add: $\frac{2}{8} + \frac{3}{8} = ?$ | 1 | 4.NF.B.3a | SMP 2, 6, 8 |
| 2 | Break $\frac{5}{8}$ into smaller parts in two different ways. | 2 | 4.NF.B.3b | SMP 2, 7, 8 |
| 3 | Use a number line to show $\frac{1}{4} + \frac{1}{4}$. Where does the sum fall on the number line? | 2 | 4.NF.B.3a | SMP 1, 4, 5 |
| 4 | Explain why $\frac{2}{4} = \frac{1}{2}$ using an area model. | 2 | 4.NF.B.3 | SMP 2, 3, 4, 7 |
| 5 | Challenge: A pizza is cut into 8 equal slices. Khalid eats $\frac{3}{8}$ and Hessa eats $\frac{2}{8}$. What fraction of the pizza is left? | 3 | 4.NF.B.3d | SMP 1, 2, 4, 6 |

# Module 9 – Addition and Subtraction Meanings and Strategies with Fractions
# Learning Objectives and Standards

| Standards | | Learning Objectives | Formative Assessment Criteria |
|---|---|---|---|
| 4.NF.B.3 Understand a fraction a/b with a > 1 as a sum of fractions 1/b.<br><br>4.NF.B.3a Understand addition and subtraction of fractions as joining and separating parts referring to the same whole.<br><br>4.NF.B.3b Decompose a fraction into a sum of fractions with the same denominator in more than one way, recording each decomposition by an equation. Justify decompositions, e.g., by using a visual fraction model.<br><br>4.NF.B.3d Solve word problems involving addition and subtraction of fractions referring to the same whole and having like | L1 | Use fraction models to decompose fractions into sums of fractions with the same denominator in more than one way. | • Write the fraction $\frac{4}{6}$ as a sum of unit fractions. |
| | L2 | Use fraction models to understand addition of fractions as joining parts that refer to the same whole.<br><br>Add fractions with like denominators. | • Using fraction bars or a drawing, show how joining three $\frac{1}{8}$ pieces makes the fraction $\frac{3}{8}$. What do you notice about the size of the parts and the total fraction?<br>• Use a model or an equation to find the sum of $\frac{2}{5}+\frac{1}{5}$. Show your reasoning using fraction bars, circles, or a number line. |
| | L3 | Use representations to show that the sum of fractions with like denominators can be found by adding the numerators and keeping the denominators the same. | • Look at this problem: $\frac{1}{6}+\frac{2}{6}=?$<br>Explain in words why the denominator stays the same when you add these fractions. |
| | L4 | Use fraction models to understand subtraction of fractions as separating parts that refer to the same whole.<br><br>Subtract fractions with like denominators. | • Draw a rectangle to represent one whole divided into eighths. Shade $\frac{6}{8}$ of it. Then show how subtracting $\frac{2}{8}$ would look.<br>What fraction of the rectangle is still shaded?<br>• Show or explain how to solve $\frac{5}{6}-\frac{2}{6}$ using a number line or a model. Describe what happens to the parts as you subtract. |
| | L5 | Use representations to show that the sum of fractions with like denominators can be found by adding the numerators and keeping the denominators the same. | • Show how $\frac{5}{8}$ can be written as a sum of unit fractions. Use a visual model to support your answer. |
| | | Use the correct units of measure to solve word problems using | • Amira drank $\frac{2}{10}$ of a jug of juice in the morning and $\frac{3}{10}$ in the afternoon. How much juice did she drink in all? Show your work using a model or an equation. |

## Notes

- The Instructional Planner (IPs) and Scope & Sequence are available on the LMS Platform.
- Grade 4 Teacher Edition Book – MINHAJI

# Understand Decomposing Fractions

## Learning Objectives

- Use fraction models to decompose fractions into sums of fractions with the same denominator in more than one way.

| Towards Mastery | Mastery | Beyond Mastery |
|---|---|---|
| Students show emerging understanding of decomposing fractions using models but may rely on visual aids and need guidance to write equations. | Students accurately decompose fractions using models and equations and explain that a fraction can be expressed as a sum of fractions with the same denominator in more than one way. | Student flexibly decompose and recompose fractions, explain patterns, and connect decomposing to operations with mixed numbers and real-world problem-solving. |

## Misconceptions and Notes

Misconceptions

- Students may think decomposition only works one way (e.g., $\frac{3}{4} = \frac{1}{4} + \frac{2}{4}$)
- Students may think decomposition changes the value.

Teacher Notes

- Emphasize that fractions can be broken down in more than one way; use models to visualize multiple decompositions.
- Show visually that $\frac{3}{4} = \frac{1}{4} + \frac{2}{4} = \frac{2}{4} + \frac{1}{4}$.

## Numeracy Skills

| Skill 1 | Skill 2 |
|---|---|
| Add like fractions. | Represent simple fractions using visual models. |

## Resources

Grade 4 Reveal Math Course 2, Teacher Edition e-Book, Volume 2
Decompose Fractions

## Domain

Numbers & Operations – Fractions

## Standards

4.NF.B.3 Understand a fraction a/b with a > 1 as a sum of fractions 1/b.
(a) Understand addition and subtraction of fractions as joining and separating parts referring to the same whole.
(b) Decompose a fraction into a sum of fractions with the same denominator in more than one way, recording each decomposition by an equation. Justify decompositions, e.g., by using a visual fraction model.

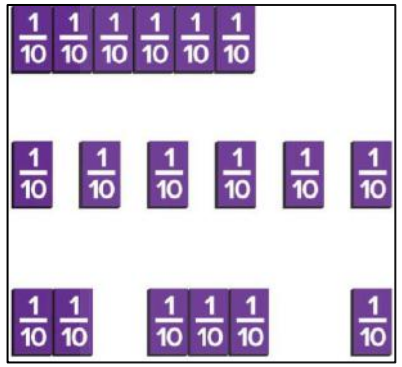
## SMPs

MPs 2 & 4

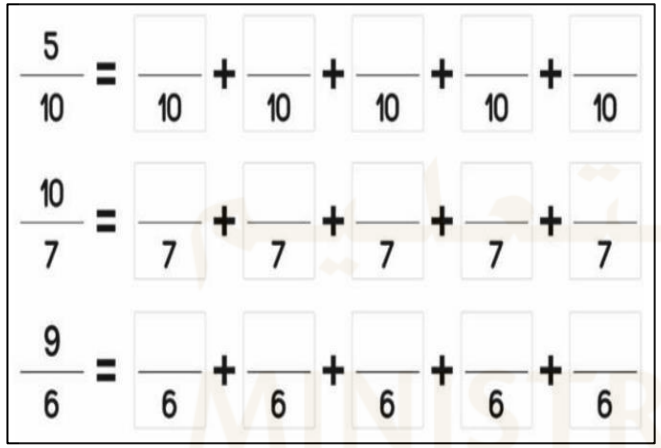
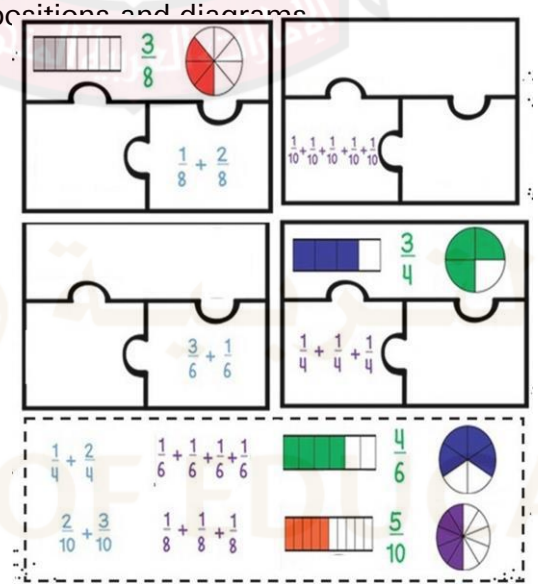
## Key Vocabulary

addend
decompose
like denominators
sum
unit fractions

# Understand Decomposing Fractions

| Towards Mastery | Mastery | Beyond Mastery |
|---|---|---|
| 1) What do you notice in the diagram below?<br>  <br><br>2) How can you decompose $\frac{5}{6}$ into a sum of 2 or 3 fractions?<br>  <br><br>✅ **Pass Criteria:**<br>Can model a single decomposition correctly using visual aids.<br>Needs prompting to find multiple ways to decompose. | 1) How can you decompose $\frac{11}{12}$ into a sum of 5 fractions?<br>□ + □ + □ + □ + □<br>2) How can you decompose $\frac{7}{10}$ into a sum of 4 fracti<br>Show<br>□ + □ + □ + □<br>□ + □ + □ + □<br>✅ **Pass Criteria:**<br>•Can decompose fractions correctly in at least two ways.<br>•Uses models and equations independently. | 1a) How can you decompose an improper fraction?<br>1b) How can you decompose $\frac{12}{9}$ into a sum of 3 fractions?<br>2) Haleema has $\frac{10}{14}$ of a breakfast casserole left over. She puts the casserole into 3 containers. What fraction of the cas t into each container?<br>  <br>3) A team of 6 people participated in a relay race. Each person ran $\frac{1}{4}$ kilometer. Another team of 4 people runs the same distance now. What distance might each of the 4 people run?<br>✅ **Pass Criteria:**<br>•Decomposes improper fractions and relates to mixed numbers. |

# Understand Decomposing Fractions

| | Towards Mastery | Mastery | Beyond Mastery |
|---|---|---|---|
| Activity Title | Decomposing Fractions | Fraction Decomposition Puzzle | Decompositions – True or False |
| Type of Activity | Hands On | Kinesthetic / Game | Group Work |
| Summary of Activity | Students will decompose the given fraction into a sum of smaller fractions. They will then draw diagrams to represent both the original fraction and its decomposition.<br>  <br>$\frac{5}{10} = \frac{\quad}{10} + \frac{\quad}{10} + \frac{\quad}{10} + \frac{\quad}{10} + \frac{\quad}{10}$<br>$\frac{10}{7} = \frac{\quad}{7} + \frac{\quad}{7} + \frac{\quad}{7} + \frac{\quad}{7} + \frac{\quad}{7}$<br>$\frac{9}{6} = \frac{\quad}{6} + \frac{\quad}{6} + \frac{\quad}{6} + \frac{\quad}{6} + \frac{\quad}{6}$ | In teams, match it with the correct fraction with the correct diagram and fraction decomposition.<br>Place all three cards together to complete the puzzle set.<br>Continue until all fractions are matched with their decompositions and diagrams.<br>  | Students have to color the fraction decomposition boxes if the fraction has the correct decomposition. There may be more than one correct answer.<br>Students have to look out for misconceptions in the incorrect fraction decompositions and justify their work.<br>$\frac{5}{6}$: $\frac{1}{6}+\frac{1}{6}+\frac{1}{6}+\frac{1}{6}+\frac{1}{6}$; $\frac{2}{4}+\frac{3}{6}$; $\frac{2}{6}+\frac{3}{6}$; $\frac{1}{4}+\frac{4}{6}$<br>$\frac{3}{4}$: $\frac{2}{6}+\frac{1}{6}$; $\frac{1}{4}+\frac{1}{4}+\frac{1}{4}$; $\frac{1}{2}+\frac{2}{2}$; $\frac{1}{4}+\frac{2}{4}$ |

# Represent Adding Fractions

## Learning Objectives

- Use fraction models to understand addition of fractions as joining parts that refer to the same whole.
- Add fractions with like denominators.

| Towards Mastery | Mastery | Beyond Mastery |
|---|---|---|
| Students can add fractions with like denominators using visual models, with some support. | Students can independently add fractions with like denominators and explain their thinking. | Students can add fractions with like denominators and apply this knowledge to problem-solving in multi-step, real-life contexts. |

## Misconceptions and Notes

Misconceptions
- Students may attempt to add denominators instead of numerators.
- Some students may confuse fractions referring to different wholes.

## Numeracy Skills

| Skill 1 | Skill 2 |
|---|---|
| Add like fractions. | Represent fractions using visual models. |

## Resources

Grade 4 Reveal Math Course 2, Teacher Edition e-Book, Volume 2
K5 Learning

## Domain

Numbers & Operations – Fractions

## Standards

4.NF.B.3 Understand a fraction a/b with a > 1 as a sum of fractions 1/b.
(a) Understand addition and subtraction of fractions as joining and separating parts referring to the same whole.
(d) Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators, e.g., by using visual fraction models and equations to represent the problem.

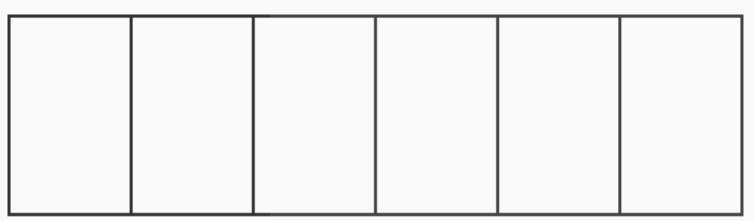
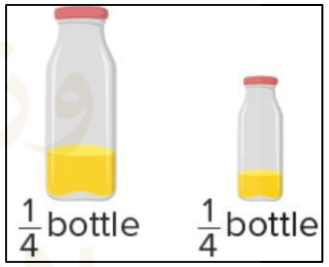
## SMPs

MPs 2 & 5

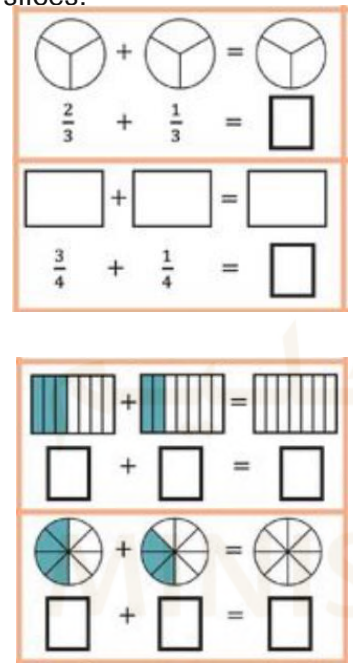
## Key Vocabulary

addend
like denominators
sum
unit fractions

# Represent Adding Fractions

| Towards Mastery | Mastery | Beyond Mastery |
|---|---|---|
| 1) Use a fraction model to represent $\frac{1}{6} + \frac{1}{6} + \frac{1}{6} + \frac{1}{6}$<br>  <br>2) If you ate $\frac{1}{6}$ of the sweets and your friend ate $\frac{3}{6}$, how much of the sweets have been eaten altogether?<br>  <br>✅ **Pass Criteria:**<br>Students can identify fractions with the same denominator.<br>Students can perform addition of fractions with like denominators with guidance. | 1) Hassan filled his glass with $\frac{2}{8}$ of orange juice and added another $\frac{3}{8}$ later. How much juice is in the glass no<br>  <br>2) Yousef has $\frac{2}{6}$ of a cake left from Friday and buys another $\frac{4}{6}$ on [illegible] does he have now?<br>  <br>✅ **Pass Criteria:**<br>Can accurately add fractions with like denominators.<br>Can translate visual representation into numeric | 1) During a school National Day event, 3 students drink $\frac{1}{5}$ liter, $\frac{2}{5}$ liter, and $\frac{1}{5}$ liter of juice each. What's the total amount of juice consumed?<br>  <br>2) Amal says if she combines the juice into one bottle, she will have a total of $\frac{1}{2}$ a bottle of juice. How can you respond to Amal? Explain your answer.<br>  <br><br>✅ **Pass Criteria:**<br>Students can solve multi-step fraction addition problems.<br>Students can justify reasoning, choose appropriate strategies and extend learning to contextual scenarios. |

# Represent Adding Fractions

| | Towards Mastery | Mastery | Beyond Mastery |
|---|---|---|---|
| Activity Title | Fractions Addition | Roll the Dice | Fraction Plates |
| Type of Activity | Hands-on | Hands-on | Group work / Hands-on |
| Summary of Activity | Students use colored or shaded diagrams to add fractions with the same denominator.<br>E.g., $\frac{1}{3}+\frac{2}{3}$ slices.<br>  | Roll the dice 3 times to create 2 fractions.<br>The biggest number becomes the denominator for both fractions, and the remaining 2 numbers become the numerator. The students will then add the fractions.<br>E.g., 2, 5, 4 will make $\frac{2}{5}+\frac{4}{5}$.<br>Teachers have the flexibility to adapt the rules<br>  | Students have to create fractions using their individual plates. It is a fun activity that visually demonstrates fractions using a paper plate. Prepare a paper plate and divide it into sections. Students have to combine their fractions and add them together.<br>The teacher can help the students to split the plates with suitable number of parts (for example: 2 parts, 4 parts, etc). Students can visualize the representation and also solve mathematically.<br>Adapt the activity for different ability students within th<br>  |

# Add Fractions with Like Denominators

## Learning Objectives

- Use representations to show that the sum of fractions with like denominators can be found by adding the numerators and keeping the denominators the same.

| Towards Mastery | Mastery | Beyond Mastery |
|---|---|---|
| Students can add fractions with like denominators with support and can represent them visually. | Students can independently add fractions with like denominators and explain the reasoning behind adding numerators while keeping the denominator constant. | Students can apply the concept of adding fractions with like denominators in multi-step problems, real-world applications, and can connect fractions to decimals or percentages. |

## Misconceptions and Notes

Misconceptions

- Students may incorrectly add denominators ($\frac{1}{4}+\frac{2}{4} \neq \frac{3}{8}$).
- Students may have confusion between fractions with like vs. unlike denominators.

## Numeracy Skills

| Skill 1 | Skill 2 |
|---|---|
| Add like fractions. | Represent fractions using visual models. |

## Resources

Grade 4 Reveal Math Course 2, Teacher Edition e-Book, Volume 2
Math Salamanders

## Domain

Numbers & Operations – Fractions

## Standards

4.NF.B.3 Understand a fraction a/b with a > 1 as a sum of fractions 1/b.
(a) Understand addition and subtraction of fractions as joining and separating parts referring to the same whole.
(d) Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators, e.g., by using visual fraction models and equations to represent the problem.

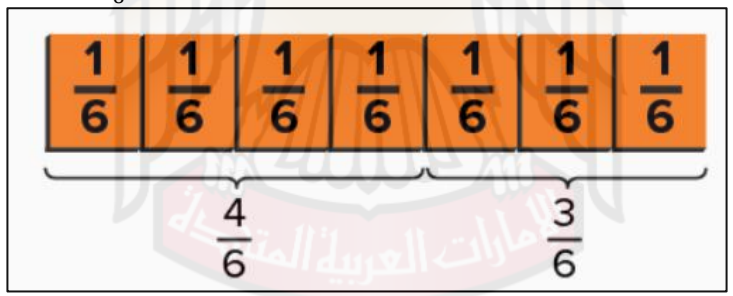
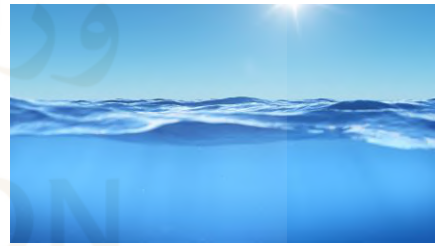
## SMPs

MP 2

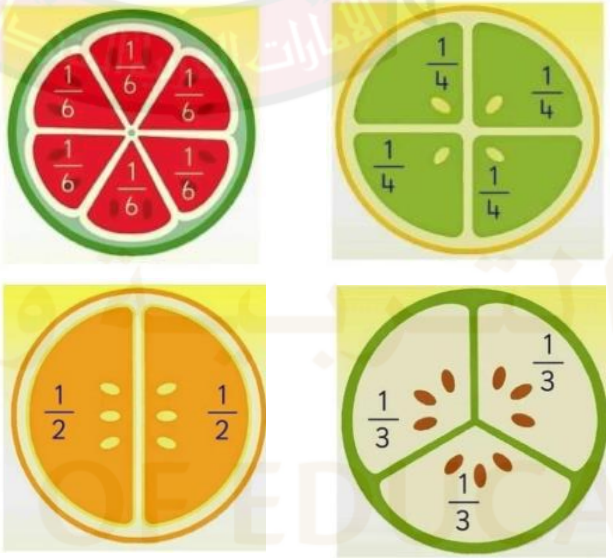
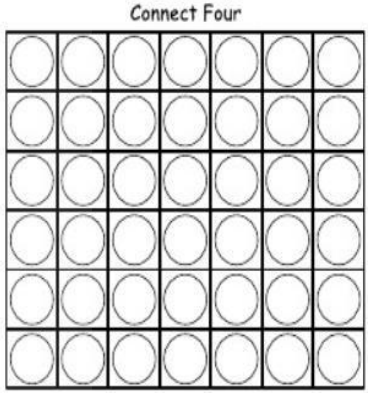
## Key Vocabulary

denominator
numerator

# Add Fractions with Like Denominators

| Towards Mastery | Mastery | Beyond Mastery |
|---|---|---|
| 1) Fatima eats $\frac{1}{4}$ of a plate of hummus, and Ahmed eats $\frac{2}{4}$ of the same plate. How much did they eat together?<br><br>Use visual representation to support your answer.<br>  <br><br>2) Aisha makes $\frac{1}{3}$ of a tray of luqaimat, and her brother adds $\frac{1}{3}$ more. How much of the tray is made now?<br><br>Use visual representation to support your answer.<br>  <br><br>✅ **Pass Criteria:**<br>Students can identify fractions with like denominators and perform addition with visual or concrete support. | 1) Omar walks $\frac{4}{6}$ of a kilometer to the mosque, and then $\frac{3}{6}$ more to his friend's house. How far did he<br>  <br><br><br>2) Salma reads $\frac{3}{10}$ of her book on Friday and $\frac{6}{10}$ on Saturday.<br>a) How much [illegible] altogether?<br>b) Did she finis<br>  <br><br>✅ **Pass Criteria:**<br>Students can add fractions without visual aids and justify their process. | 1) Safa is preparing kunafa. She uses $\frac{2}{4}$ of a cup of sugar in the first batch, $\frac{3}{4}$ in the second, and $\frac{1}{4}$ in the third. How many cups of sugar did she use in total? Write your answer as a mixed number if needed.<br>  <br><br>2) Rashed fills $\frac{5}{6}$ of a tank in the morning and $\frac{4}{6}$ of the tank in the evening. How much water is in the tank now? How does this total compare to one full tank?<br>  <br><br>✅ **Pass Criteria:**<br>Students can solve complex problems and explain the reasoning in multiple contexts. |

# Add Fractions with Like Denominators

| | Towards Mastery | Mastery | Beyond Mastery |
|---|---|---|---|
| Activity Title | Lego Fractions | Fruit Fractions Spinner | Connect 4 Fractions |
| Type of Activity | Hands-on, manipulative-based | Group work, word problems | Hands-on/Game |
| Summary of Activity | Using Lego bricks to visualize fractions is an effective way to teach the concept of parts and wholes.<br>Select Lego bricks of the same size and color to represent one whole unit — for example, a stack of four bricks can represent 1.<br>This activity allows learners to build and deconstruct fractions, reinforcing concepts such as equivalence and addition of fractions in ar<br>  | Students can create fruit spinners that feature various fractions and use it to explore different fractional parts in a fun way. This activity allows students to spin, choose fractions, and add them together.<br>  | Fraction with Connect 4 is a creative twist on the classic game, helping learners practice fractions while playing. Modify the game by assigning fractions to the Connect 4 discs (e.g., $\frac{1}{4}, \frac{1}{3}, \frac{1}{2}$) and using them to represent parts of a whole. Players take turns dropping a disc into the grid, aiming to align fractions that add up to 1 whole.<br>  <br>  |

# Represent Subtracting Fractions

## Learning Objectives

- Use fraction models to understand subtraction of fractions as separating parts that refer to the same whole.
- Subtract fractions with like denominators.

| Towards Mastery | Mastery | Beyond Mastery |
|---|---|---|
| Students can recognize fractions with like denominators.<br><br>Students can identify parts of a whole but struggle to subtract them accurately.<br><br>Students require guidance to model subtraction using fraction strips or number lines. | Students can accurately subtract fractions with like denominators.<br><br>Students can demonstrate understanding by using visual models and equations.<br><br>Students can explain the process of subtraction in their own words. | Students can subtract fractions with like denominators fluently and efficiently.<br><br>Students can apply understanding to solve complex problems, including word problems.<br><br>Students can create and explain their own fraction subtraction problems. |

## Misconceptions and Notes

Misconceptions
- Subtracting fractions means subtracting the denominators.
- The larger numerator always represents the larger fraction.

Teacher Notes
- Only subtract the numerators; the denominator remains the same.
- The size of a fraction depends on both the numerator and denominator.

## Numeracy Skills

| Skill 1 | Skill 2 |
|---|---|
| Subtract like fractions. | Represent fractions using visual models. |

## Resources

Grade 4 Reveal Math Course 2, Teacher Edition e-Book, Volume 2
Splash Learn

## Domain

Numbers & Operations – Fractions

## Standards

4.NF.B.3 Understand a fraction a/b with a > 1 as a sum of fractions 1/b.
(a) Understand addition and subtraction of fractions as joining and separating parts referring to the same whole.
(d) Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators, e.g., by using visual fraction models and equations to represent the problem.

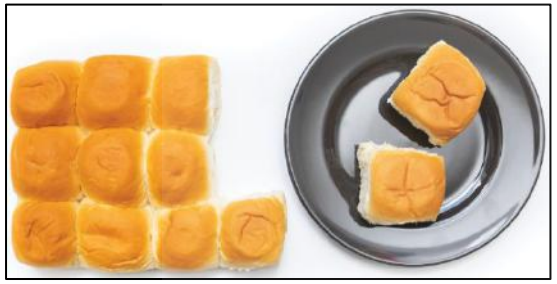
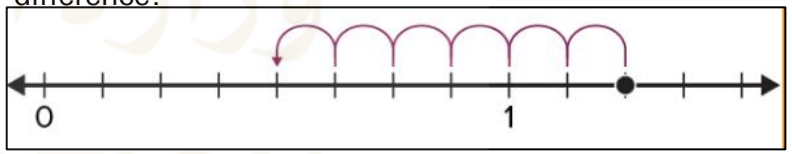
## SMPs

MP 4

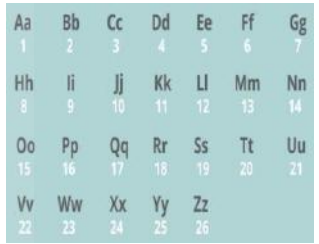
## Key Vocabulary

denominator
numerator
difference

# Represent Subtracting Fractions

| Towards Mastery | Mastery | Beyond Mastery |
|---|---|---|
| 1) Describe what you notice in the picture below.<br>  <br>2) Saeed's mother made a pizza and cut it into 8 slices. Saeed ate $\frac{5}{8}$. What fraction of the pizza is left? Use a representation to show your work.<br>  <br>✅ **Pass Criteria:**<br>Students can identify the correct fraction model but may need assistance in performing the subtraction. | 1) Mariam's kite string was $\frac{7}{10}$ of a meter long. If $\frac{3}{10}$ of it broke off, how long is the string now?<br>  <br>2) Khalifa has to paint $\frac{8}{10}$ of a wall. He pauses after finishing $\frac{3}{10}$.<br>How much [illegible] complete the wall?<br>  <br>✅ **Pass Criteria:**<br>Students can complete subtraction problems correctly with visual models and provide clear explanations. | 1) Yasmin prepared 1 whole tray of dates. Her family ate $\frac{5}{8}$ of it at iftar and $\frac{2}{8}$ at suhoor.<br>What fraction of the tray is left?<br>  <br>2) Hamdan used a number line to find the difference of two fractions.<br>What equation can you write to represent the difference?<br>  <br><br>✅ **Pass Criteria:**<br>Students can solve complex problems accurately and articulate reasoning clearly. |

# Represent Subtracting Fractions

| | Towards Mastery | Mastery | Beyond Mastery |
|---|---|---|---|
| Activity Title | 4 letters Challenge | | |
| Type of Activity | Hands-on / Manipulative-based | | |
| Summary of Activity | Focus: Identify fractions and compare simple ones with like denominators. Teacher Support: Provide a list of easy, familiar words and guide denominator choice.<br><br>Instructions:<br>Choose from teacher-given words (e.g., BALL, BOOK, NOTE, HAND).<br>Write the value for each letter.<br>Make two fractions with the same denominator (teacher decides).<br><br>Compare the two fractions using <, >, or =.<br><br>Example:<br>Word: BALL → B=2, A=1, L=12, L=12<br>Teacher sets denominator = 12<br>Fractions: $\frac{2}{12}$ and $\frac{1}{12}$<br>Compare: $\frac{2}{12} > \frac{1}{12}$<br>Operation: $\frac{2}{12} - \frac{1}{12} = \frac{1}{12}$<br>  | Focus: Create and operate with fractions having like denominators.<br><br>Instructions:<br>Choose any 4-letter word.<br>Use the alphabet values to form two fractions with the same denominator (student decides which number to use as denominator).<br><br>Add or subtract the fractions.<br>Simplify the result if possible.<br><br>Example:<br>Word: CAGE → C=3, A=1, G=7, E=5<br><br>Choose denominator = 7<br><br>Fractions: $\frac{3}{7}$ and $\frac{1}{7}$<br><br>Operation: $\frac{3}{7} - \frac{1}{7} = \frac{2}{7}$<br>  | Focus: Apply reasoning and creativity using like denominators to explore patterns.<br>Instructions:<br><br>Create two or more 4-letter words.<br>Make pairs of fractions (with like denominators) from each word.<br>Perform two operations (e.g., add then subtract) or find combinations that give a target fraction (like 1 or $\frac{1}{2}$).<br><br>Explain reasoning in words or with a diagram.<br><br>Example:<br>Word: MATH → 13, 1, 20,<br><br>Choose denominator = 20<br><br>Fractions: $\frac{13}{20}$ and $\frac{1}{20}$<br><br>Operation: $\frac{13}{20} - \frac{1}{20} = \frac{12}{20} = \frac{6}{10}$<br>  |

# Subtract Fractions with Like Denominators

## Learning Objectives

- Use representations to show that the sum of fractions with like denominators can be found by adding the numerators and keeping the denominators the same.

| Towards Mastery | Mastery | Beyond Mastery |
|---|---|---|
| Students can subtract fractions with like denominators using visual representations and concrete models but may require guidance. | Students independently subtract fractions with like denominators and solve word problems using representations and numerators subtraction | Students apply subtraction of fractions with like denominators in multi-step problems, compare fractions, and explain reasoning. |

## Misconceptions and Notes

Misconceptions
- Students may incorrectly subtract denominators instead of numerators.
- Students may have confusion between addition and subtraction of fractions.
- Students may have a misunderstanding the concept of fractions as parts of a whole versus separate items.

## Numeracy Skills

| Skill 1 | Skill 2 |
|---|---|
| Subtract like fractions. | Represent fractions using visual models. |

## Resources

Grade 4 Reveal Math Course 2, Teacher Edition e-Book, Volume 2
K5 Math

## Domain

Numbers & Operations – Fractions

## Standards

4.NF.B.3 Understand a fraction a/b with a > 1 as a sum of fractions 1/b.
(a) Understand addition and subtraction of fractions as joining and separating parts referring to the same whole.
(d) Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators, e.g., by using visual fraction models and equations to represent the problem.

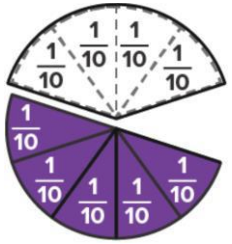
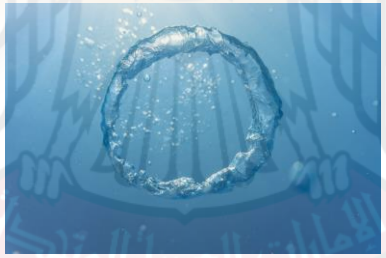
## SMPs

MP 2

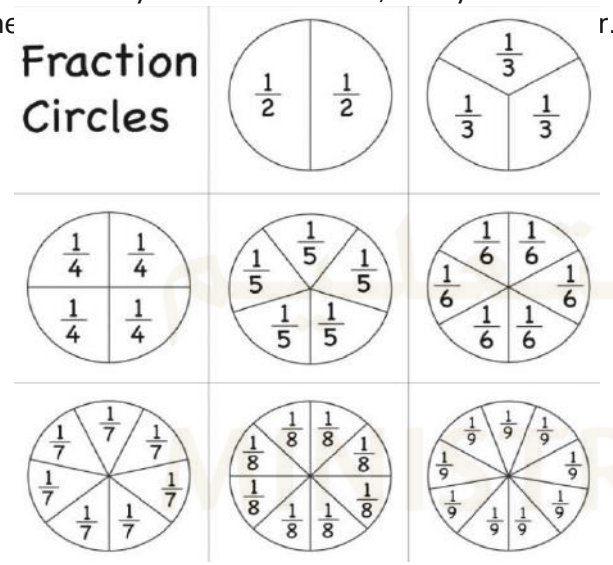
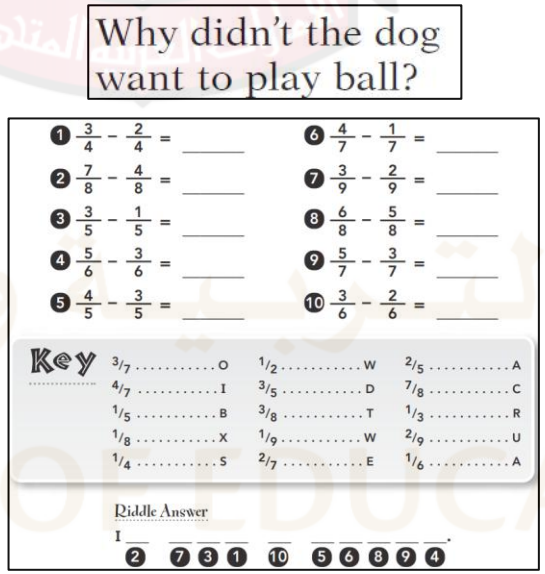
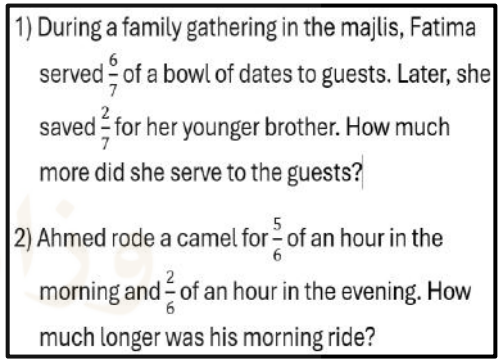
## Key Vocabulary

Difference

# Subtract Fractions with Like Denominators

| Towards Mastery | Mastery | Beyond Mastery |
|---|---|---|
| 1) Ammar had pens in $\frac{9}{10}$ of the container. He used pens from $\frac{4}{10}$ of the container to write some stories. How much of the container still has pens in it?<br>  <br><br>2) Huda baked $\frac{9}{10}$ of a tray of cookies and gave $\frac{3}{10}$ away. How much of the tray is left?<br>Use a representation to show your work.<br>  <br>✅ **Pass Criteria:**<br>Students can represent subtraction using fraction strips or number lines.<br>Students can correctly subtract numerators when denominators are the same with partial teacher support. | 1) A tank was $\frac{7}{12}$ full of water. Camryn drained $\frac{5}{12}$ of the tank. How much of the tank is still filled with water?<br>  <br>2) Hamad's home is $\frac{7}{8}$ meter from school. He stops at the library on his way home. The library is $\frac{4}{8}$ meter from th<br>t<br>  <br>  <br>✅ **Pass Criteria:**<br>Students can subtract fractions correctly without assistance.<br>Students can solve real-life word problems involving | 1) Latifa has $\frac{5}{6}$ meter of string. She cuts off $\frac{3}{6}$ meter to make a bracelet.<br>Does Latifa have more than or less than $\frac{1}{2}$ meter to make a bracelet with the remaining string left?<br>  <br>2) Rabia eats $\frac{2}{4}$ of a large protein bar. Sammi eats $\frac{3}{4}$ of a small protein bar. Hessa says Sammi ate more. Do you agree?<br>  <br>✅ **Pass Criteria:**<br>Students can solve multi-step problems independently.<br>Students can explain the subtraction process using diagrams or number lines.<br>Students can create word problems involving fractions for peers. |

# Subtract Fractions with Like Denominators

| | Towards Mastery | Mastery | Beyond Mastery |
|---|---|---|---|
| Activity Title | Fraction Circles | Fraction Riddles | Fraction Word Problems |
| Type of Activity | Individual | Individual | Group work/Creative writing |
| Summary of Activity | Students will choose one of the fraction circles.<br>First, students will shade the minuend (the starting fraction) and then cross out the number of parts equal to the subtrahend (The fraction they wish to subtract). They will count the r.<br>  | Students have to solve their subtraction problems below. Write your answers in the simplest for. Match each answer to a letter in the key and then write the letter in the space above the problem number to find the answer to the riddle.<br>  | Students solve subtraction fraction problems and explain their reasoning.<br>  |

# Solve Problems Involving Fractions

## Learning Objectives

- Use the correct units of measure to solve word problems using addition and subtraction of fractions with like denominators.

| Towards Mastery | Mastery | Beyond Mastery |
|---|---|---|
| Students can demonstrate a basic understanding of fractions and their addition/subtraction.<br>Students require support to identify and apply appropriate units of measure in word problems. | Students can accurately solve word problems involving the addition and subtraction of fractions with like denominators.<br>Students can consistently apply appropriate units of measure in various contexts. | Students can demonstrate a deep understanding of fractions and their operations.<br>Students can apply knowledge to complex, multi-step word problems with varying units of measure. |

## Misconceptions and Notes

Misconceptions
- Assuming that fractions with different denominators can be added or subtracted directly without finding a common denominator.
- Forgetting to simplify fractions after performing operations.

Teacher Notes
- Use visual aids like fraction strips or number lines to illustrate fraction addition and subtraction.
- Provide real-life scenarios, such as sharing food or measuring ingredients, to contextualize word problems.

## Numeracy Skills

| Skill 1 | Skill 2 |
|---|---|
| Add and Subtract fractions. | Represent fractions using visual models. |

## Resources

Grade 4 Reveal Math Course 2, Teacher Edition e-Book, Volume 2
IXL

## Domain

Numbers & Operations – Fractions

## Standards

4.NF.B.3 Understand a fraction a/b with a > 1 as a sum of fractions 1/b.
(a) Understand addition and subtraction of fractions as joining and separating parts referring to the same whole.
(d) Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators, e.g., by using visual fraction models and equations to represent the problem.

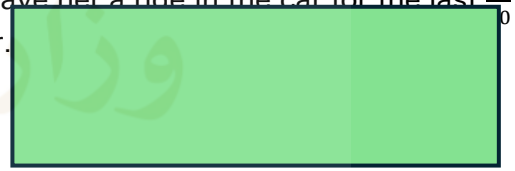
## SMPs

MP 2

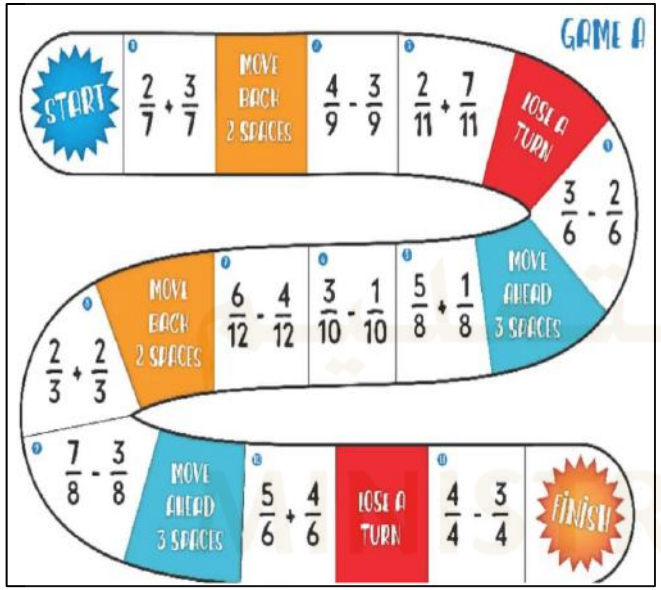
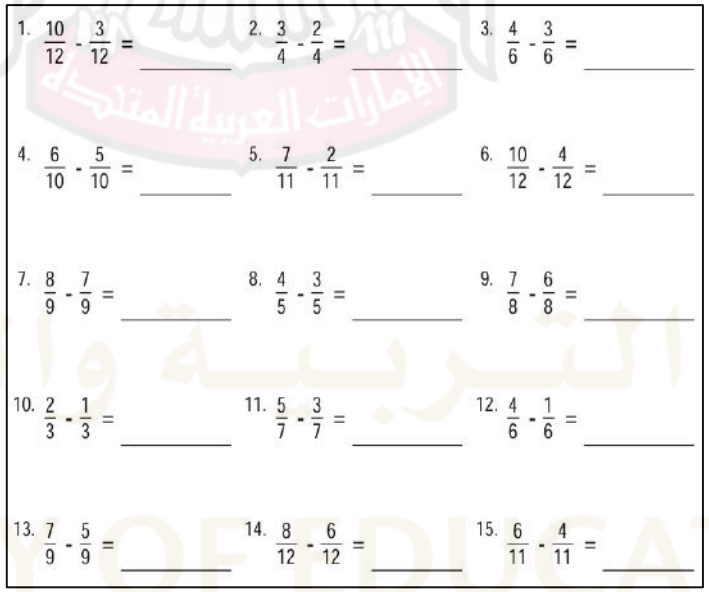
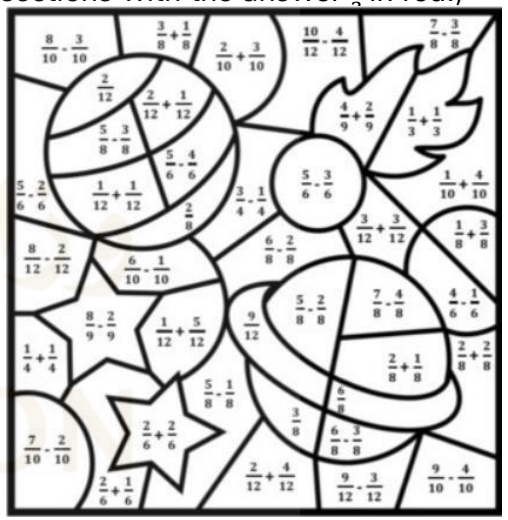
## Key Vocabulary

difference
sum

# Solve Problems Involving Fractions

| Towards Mastery | Mastery | Beyond Mastery |
|---|---|---|
| 1) Musa has $\frac{1}{4}$ of a chocolate bar, and you have given him another $\frac{1}{4}$, how much chocolate does Musa have altogethe<br>  <br>2a) Tariq is adding time. He is adding $\frac{1}{4}$ hour and $\frac{2}{4}$ hour. How much time has been added together as a fraction of an hour?<br>2b) Can you<br>  <br>✅ **Pass Criteria:**<br>Students can add or subtracts fractions with like denominators.<br>Students can identify the correct units of measure in | 1) Mansoor makes his own trail mix. He uses $\frac{7}{8}$ kg of peanuts in the trail mix. He uses $\frac{4}{8}$ kg less raisins than peanuts.<br>What is the to<br>  <br>2) Hadi and Hamza are painting a wall. Hadi painted $\frac{4}{10}$ of the wall. Hamza painted $\frac{3}{10}$ of the wall. How much of the wall still needs to<br>  <br>✅ **Pass Criteria:**<br>Students can solve addition and subtraction problems involving fractions with like denominators.<br>Students can use appropriate units of measure in answers. | 1) To make a fruit salad, Huda uses $\frac{5}{6}$ kilograms of oranges. She uses $\frac{2}{6}$ kilogram less berries than oranges. What is the total weight of the oranges<br>   <br>2) Yasmin planned to walk around the entire rectangular park. The length of the park is $\frac{7}{10}$ kilometer, and the width of the park is $\frac{3}{10}$ kilometer. However, her mother gave her a ride in the car for the last $\frac{4}{10}$ kilometer.<br>  <br>✅ **Pass Criteria:**<br>Students can solve complex word problems involving fractions with like denominators.<br>Students can apply and convert between different units of measure as required. |

# Solve Problems Involving Fractions

| | Towards Mastery | Mastery | Beyond Mastery |
|---|---|---|---|
| Activity Title | Fraction Frenzy Board Game | DIY Fraction Hats | Fraction Coloring |
| Type of Activity | Hands-on, Game | Hands-on/Groupwork | Individual |
| Summary of Activity | Students move along the board by rolling dice. To move forward, they must solve the fraction problem correctly.<br>  | Students will complete the worksheet to find the difference. Then peer check.<br>  | Students have to solve the questions on adding and subtracting fractions. After working out all the answers to the questions, the students will allocate different colors to different answers and complete the artwork.<br>(For example, the student may choose to color all the sections with the answer $\frac{1}{2}$ in red.)<br>  |

# Addition and Subtraction Meanings and Strategies with Fractions

❖ This section aims to assess how well students have mastered the module objectives upon completion of the module.

| Question Number | Question | DOK Level | Standard | SMPs |
|---|---|---|---|---|
| 1 | Decompose $\frac{7}{10}$ into a sum of unit fractions. | 1 | 4.NF.B.3b | SMP 2, 6, 7 |
| 2 | $\frac{5}{6} = \frac{3}{6} + ?$<br>What fraction completes the equation? | 2 | 4.NF.B.3b | SMP 1, 2, 6, 7 |
| 3 | Show $\frac{2}{6} + \frac{1}{6}$ on a number line. Mark the sum on the number line. | 2 | 4.NF.B.3a | SMP 1, 4, 5 |
| 4 | Subtract: $\frac{6}{10} - \frac{3}{10}$<br>Draw a model to justify. | 3 | 4.NF.B.3a | SMP 1, 2, 3, 6 |
| 5 | Aisha baked two pans of brownies. She gave away $\frac{5}{8}$ of one pan and $\frac{3}{8}$ of the other. How much of both pans did she give away in total? Prove using two models and equations. | 4 | 4.NF.B.3d | SMP 1, 2, 3, 4, 5, 6, 7, 8 |

# Addition and Subtraction Strategies with Mixed Numbers

## Notes & Guidance

In this unit, students are introduced to mixed numbers as numbers that have a whole-number part and a fraction part. They use this understanding to decompose a mixed number into a sum of whole numbers and/or fractions in different ways. They extend the idea that a fraction can be written as the sum of unit fractions to the idea that a mixed number can be written as the sum of fractions.

Students extend their work with adding and subtracting fractions with like denominators to adding and subtracting mixed numbers with like denominators. They use representations to make sense of different addition and subtraction strategies. These strategies include decomposing one or both mixed numbers and writing the mixed numbers as fractions greater than 1 to add or subtract.

## Pedagogy

- Start with concrete and visual models: use fraction strips, number lines, or pictorial models of mixed numbers (e.g., 2 ⅖ represented as 2 wholes + 2 fifth-pieces) to ensure students see the mixed number structure.

- Use "choose strategy" tasks: present problems like "4 ¼ + 2 ⅗" and ask students to decide whether they will (a) add whole parts then fractional parts, (b) convert to improper fractions then add, or (c) use a benchmark (e.g., combine nearest whole then adjust). Encourage discussion of which strategy is efficient.

- Differentiation: for students ready for more challenge, present unlike-denominator mixed-number operations (e.g., 3 ⅖ + 1 ¾) and ask them to find efficient strategies for finding common denominators, simplifying, and converting to mixed numbers.

## Key Skills

- Recognize and understand a mixed number as a sum of a whole number and a proper fraction.
- Convert between mixed numbers and improper fractions and vice-versa when this aids calculation.
- Add two mixed numbers by choosing an efficient strategy (separate whole and fractional parts, convert and add.)
- Subtract two mixed numbers, including cases requiring borrowing or rewriting the mixed number.
- Determine which strategy will be most efficient for a given problem and articulate reasoning (metacognitive skill).

## International Assessment Links

**Number**

Recognize fractions as parts of wholes or collections; represent fractions using words, numbers, or models; compare and order simple fractions; add and subtract simple fractions, including those set in problem situations.

**Quantity (Mathematical Literacy)**

Understanding numbers, measurement, magnitude, partitions, units, and their relationships.

# Addition and Subtraction Strategies with Mixed Numbers

- This section aims to identify the fundamental knowledge and skills that students already possess before starting the module, as well as any areas that may need support or review to strengthen new learning. Teachers can use this section to conduct a quick check of

| Question Number | Question | DOK Level | Standard | SMPs |
|---|---|---|---|---|
| 1 | Write $2\frac{1}{4}$ as an improper fraction. | 1 | 4.NF.B.3b | SMP 2, 6, 7 |
| 2 | Decompose $3\frac{2}{5}$ into whole and fraction parts using an equation. | 2 | 4.NF.B.3b | SMP 2, 7, 8 |
| 3 | Add: $1\frac{2}{6} + 1\frac{3}{6}$. Show your work. | 2 | 4.NF.B.3c | SMP 1, 2, 6 |
| 4 | Subtract: $3\frac{4}{5} - 1\frac{1}{5}$ using a model. | 3 | 4.NF.B.3c | SMP 1, 4, 5, 6 |
| 5 | Real-World Context: Ahmed ran $2\frac{1}{2}$ km on Monday and $1\frac{1}{2}$ km on Tuesday. How many kilometers did he run in total? | 3 | 4.NF.B.3d | SMP 1, 2, 4, 6 |

# Module 10 – Addition and Subtraction Strategies with Mixed Numbers
# Learning Objectives and Standards

| Standards | | Learning Objectives | Formative Assessment Criteria |
|---|---|---|---|
| 4.NF.B.3 Understand a fraction a/b with a > 1 as a sum of fractions 1/b.<br><br>4.NF.B.3b Decompose a fraction into a sum of fractions with the same denominator in more than one way, recording each decomposition by an equation. Justify decompositions, e.g., by using a visual fraction model.<br><br>4.NF.B.3c Add and subtract mixed numbers with like denominators, e.g., by replacing each mixed number with an equivalent fraction, and/or by using properties of operations and the relationship between addition and subtraction.<br><br>4.NF.B.3d Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators, e.g., by using visual fraction models and equations to represent the problem. | L1 | Use mixed numbers as a way to write fractions greater than 1.<br><br>Use fraction models to decompose a mixed number in more than one way and write equations to record their decompositions. | • How can you show that $2\frac{1}{2}$ is the same as the sum of a whole number and a fraction? Write an equation and explain your reasoning using a picture or words.<br>• Show two different ways to write $2\frac{3}{4}$ as a sum of fractions with denominator 4. |
| | L2 | Represent addition of mixed numbers with like denominators using fraction models. | • Use a fraction strip or number line to show and find the sum $1\frac{2}{3} + 1\frac{1}{3}$. Explain how your model shows the total as a mixed number. |
| | L3 | Add mixed numbers using strategies such as using equivalent fractions that are greater than 1 and decomposing the mixed numbers. | • Add $3\frac{1}{4} + 2\frac{3}{4}$ by separating the whole numbers and fractions. |
| | L4 | Represent subtraction of mixed numbers with like denominators using fraction models. | • Use a fraction strip or number line to show $3\frac{1}{2} + 1\frac{1}{4}$. Explain how the model helps you see the difference. |
| | L5 | Subtract mixed numbers using strategies such as using equivalent fractions and related addition equations. | • Solve $4\frac{1}{3} + 2\frac{2}{3}$. Use one of these methods: a) Regrouping (turn a whole into fractions), b) Decomposition or c) A visual model (number line or area model) |
| | L6 | Represent and solve word problems involving addition and subtraction of mixed numbers with like denominators. | • Maria ran $2\frac{1}{2}$ km on Monday and $3\frac{1}{4}$ km on Tuesday. How far did she run in total? If she planned to run 7 km for the week, how |

## Notes

- The Instructional Planner (IPs) and Scope & Sequence are available on the LMS Platform.
- Grade 4 Teacher Edition Book – MINHAJI

# Understand Decomposing Mixed Numbers

## Learning Objectives

- Use mixed numbers as a way to write fractions greater than 1.
- Use fraction models to decompose a mixed number in more than one way and write equations to record their decompositions.

| Towards Mastery | Mastery | Beyond Mastery |
|---|---|---|
| • Recognizes mixed numbers and can express them as sums of fractions with the same denominator. | • Accurately decomposes mixed numbers in multiple ways and records equations. | • Applies decomposition skills to solve real-world problems and justifies reasoning. |

## Misconceptions and Notes

Misconceptions
- Mixed numbers cannot be decomposed into sums of fractions.
- Only improper fractions can be decomposed.

Teacher Notes
- Mixed numbers can be expressed as sums of fractions with the same denominator, aiding in understanding their value.
- Both proper and improper fractions, as well as mixed numbers, can be decomposed into sums of fractions.

## Numeracy Skills

| Skill 1 | Skill 2 |
|---|---|
| Understand and model fractions with like denominators.<br>Identify wholes and parts in a model. | Represent mixed numbers using visual models |

## Resources

Grade 4 Reveal Math Course 2, Teacher Edition e-Book, Volume 2
K5 Learniing

## Domain

Numbers & Operations - Fractions

## Standards

4.NF.B.3 Understand a fraction a/b with a > 1 as a sum of fractions 1/b.
(b) Decompose a fraction into a sum of fractions with the same denominator in more than one way, recording each decomposition by an equation. Justify decompositions, e.g., by using a visual fraction model.

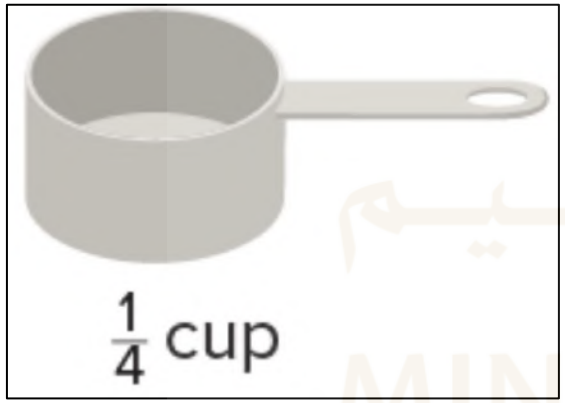
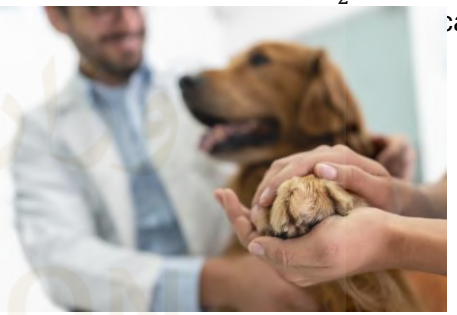
## SMPs

MPs 2 & 7

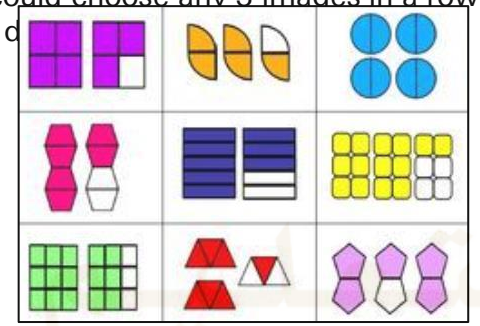
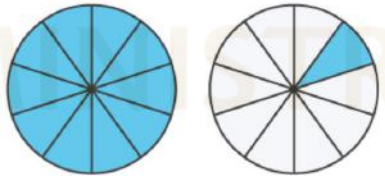
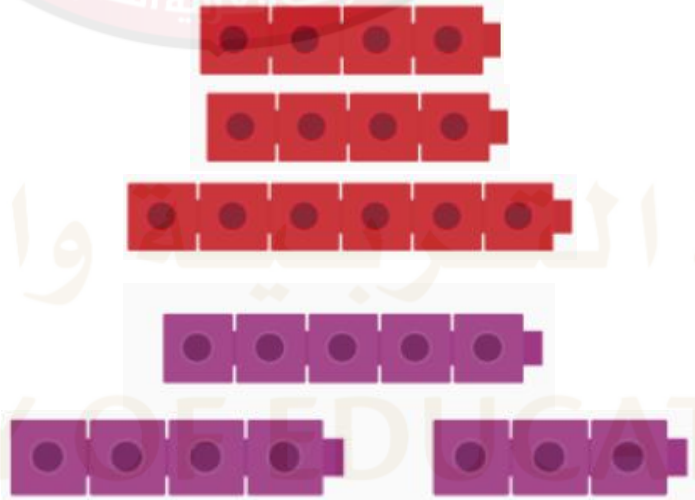
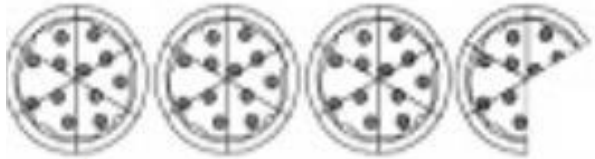
## Key Vocabulary

decompose
mixed number

# Understand Decomposing Mixed Numbers

| Towards Mastery | Mastery | Beyond Mastery |
|---|---|---|
| 1a) How are the two diagrams below the same?<br>1b) How are they different?<br>  <br>2) Lina needs to measure $2\frac{3}{4}$ cups of flour to make muffins. She only has the measuring cup shown. How many times will Lina need to fill the measuring cup?<br>  <br>✅ **Pass Criteria:**<br>Students can decompose simple mixed numbers into sums of fractions with like denominators. | 1) How can you decompose $2\frac{3}{4}$ ? Write an equation to represent the decomposition.<br><br>2) Can you show or explain which fraction is equivalent to $5\frac{3}{5}$ ?<br><br>✅ **Pass Criteria:**<br>Students can demonstrate understanding by decomposing mixed numbers in at least two different ways with equations. | 1) Ramez took 36 apple slices to a class picnic. Each slice was of $\frac{1}{8}$ apple. How many apples did Ramez take to the picnic?<br>  <br>2) A veterinarian prescribed $\frac{1}{2}$ pill each day for Paul's dog. She gave him a bottle with $7\frac{1}{2}$ pills. How many days doe cation?<br>  <br>✅ **Pass Criteria:**<br>Students can solve complex problems involving mixed numbers and provide logical explanations for decompositions. |

# Understand Decomposing Mixed Numbers

| | Towards Mastery | Mastery | Beyond Mastery |
|---|---|---|---|
| Activity Title | Fraction Decomposition with Diagrams | Fraction Decomposition with Cubes | Real-Life Mixed Numbers Problems |
| Type of Activity | Individual | Hands On/Manipulatives | Real-life Application |
| Summary of Activity | Using the images given below, students will write the appropriate improper fraction that each image represents. Students can convert the improper fraction into a mixed number with teacher guidance.<br>Students could choose any 3 images in a row, column or d<br>  <br>Students can decompose mixed number of their choice and re<br>Example: $1\frac{1}{10}$<br>  | Students need to use the cubes to show their understanding of mixed numbers. Students will use 3 sets of cubes of one color to represent the 3 parts of a mixed number. They will illustrate it with the cubes and write down the mixed numbers.<br>  | Students will use real-life food objects to identify the mixed numbers shown below and then create their own word problems.<br>  <br>  |

# Represent Adding Mixed Numbers

## Learning Objectives

By the end of the lesson, students will be able to represent addition of mixed numbers with like denominators using fraction models.

| Towards Mastery | Mastery | Beyond Mastery |
|---|---|---|
| • Students can represent and combine fractional parts using models (e.g., fraction tiles, circles). | • Students can accurately represent addition of mixed numbers with like denominators using visual models or drawings. | • Students can represent and explain mixed number addition problems in multiple ways — using models, drawings, equations, and reasoning in real-world contexts. |

## Misconceptions and Notes

Students treat mixed numbers as two separate numbers.

## Basic Mathematical Skills

| Skill One | Skill Two |
|---|---|
| Understand and model fractions with like denominators.<br>Identify wholes and parts in a model. | Represent mixed numbers using visual models |

## Suggested Resources

Grade 4 Reveal Math Course 2, Teacher Edition e-Book, Volume 2
Mixed Fraction Addition worksheet

## Domain

Number & Operations—Fractions

## Standards

4.NF.B.3 Understand a fraction a/b with a > 1 as a sum of fractions 1/b.
4.NF.B.3.c Add and subtract mixed numbers with like denominators.
4.NF.B.3.d Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators.

## SMPs

MP 4, 5

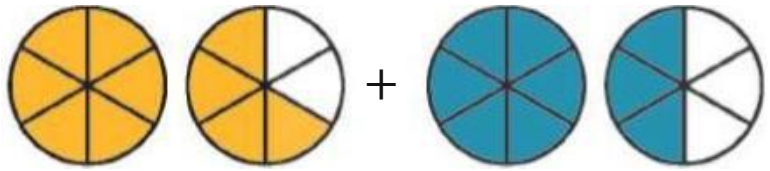
## Key Vocabulary

Mixed number
Sum

# Represent Adding Mixed Numbers

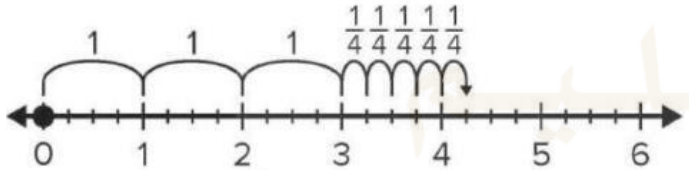
## Towards Mastery

- Write down the fraction equation represented in the fraction circles below.



_____+ _____

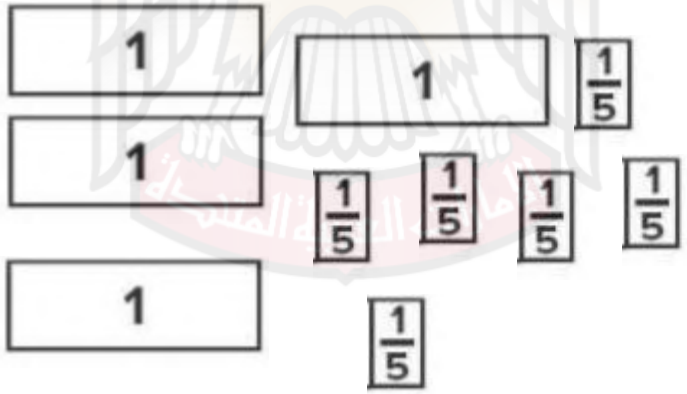
- What is the sum of the mixed number shown on the number line?



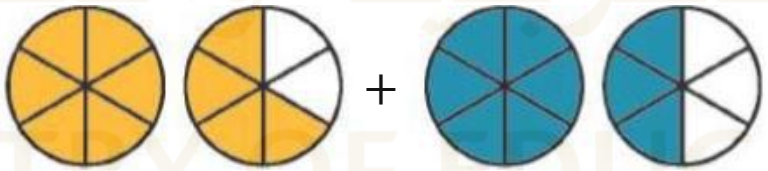

$1\frac{\square}{4} + 2\frac{\square}{4} =$ _____

## Mastery

- Arrange the fraction cards or strips to represent the sum $1\frac{2}{5} + 3\frac{4}{5}$.




What is the sum of the mixed numbers shown below?



_____+ _____ = _____

## Beyond Mastery

- Use fraction tiles/cards to represent each sum. The find the sum using your representation.

1) $1\frac{2}{5} + 2\frac{2}{5}$

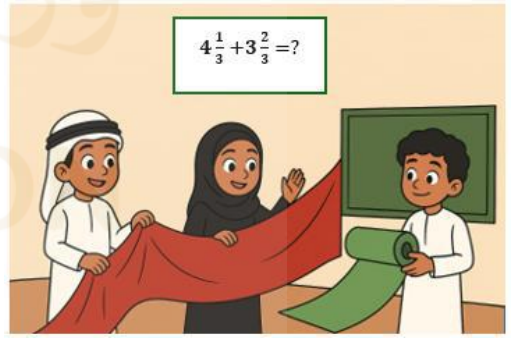
2) $2\frac{3}{4} + 1\frac{2}{4}$

3) $2\frac{5}{8} + 1\frac{7}{8}$

4) $2\frac{2}{6} + 1\frac{3}{6}$

- Leena has $1\frac{2}{5}$ kilograms of peaches. She buys another $2\frac{2}{5}$ kilograms of peaches at the grocery. How many kilograms of peaches does she have now? Use fractions tiles to show your work.

# Represent Adding Mixed Numbers

| | Towards Mastery | Mastery | Beyond Mastery |
|---|---|---|---|
| Activity Title | Fruit Tray Fractions | Carpet Design Challenge | Flag Decoration Project |
| Type of Activity | Hands-on, manipulative-based | Real-life hands-on / drawing task | Group collaboration |
| Summary of Activity | • Students use fraction tiles to model 2½ + 1½.<br>• They group whole and fractional parts separately.<br>• Discuss what happens when halves make a new whole.<br><br>Question: Aisha prepared 2½ trays of watermelon for the National Day celebration. K… t…   | • Students draw two carpet strips: one 3 ¾ m, the other 2¼ m.<br>• Shade or label the fractional parts.<br>• Add using fraction models, then verify with equations.<br><br>Question: Adam is designing two traditional carpet strips for a UAE Heritage Day exhibition. One strip is 3¾ meters long and another is 2¼ meters long. What is the total length of both carpet strips? | • Students plan a classroom decoration using cloth lengths.<br>• They add mixed numbers (e.g., 4⅓ + 3⅔) to calculate total materials needed.<br>• Present reasoning with both visual and numeric models.<br><br>Question: For UAE National Day, a group of students are decorating their classroom. They use 4⅓ meters of red cloth for the flag wall and 3⅔ meters of green cloth for the cultural corner. How many meters of cloth did they use in total?   |

# Add Mixed Numbers

## Learning Objectives

By the end of the lesson, students will be able to add mixed numbers using strategies such as using equivalent fractions that are greater than 1 and decomposing the mixed numbers.

| Towards Mastery | Mastery | Beyond Mastery |
|---|---|---|
| • Students can represent mixed numbers and add whole and fractional parts separately.<br>• Students may need guidance regrouping when fractional sums exceed one whole. | • Students can accurately add mixed numbers with like denominators.<br>• Students can regroup fractional parts correctly and explain their process using models or equations. | • Students can efficiently apply multiple strategies (decomposition, conversion to improper fractions) and justify their choice in solving real-world problems. |

## Misconceptions and Notes

Students add denominators.
Students treat mixed numbers as separate entities instead of sums.

## Basic Mathematical Skills

| Skill One | Skill Two |
|---|---|
| Recognize and represent mixed numbers with like denominators using models. | Add fractions and whole numbers separately.<br>Regroup fractional sums greater than 1 as mixed numbers. |

## Suggested Resources

Grade 4 Reveal Math Course 2, Teacher Edition e-Book, Volume 2
Mixed Fraction Addition worksheet

## Domain

Number & Operations—Fractions

## Standards

4.NF.B.3 Understand a fraction a/b with a > 1 as a sum of fractions 1/b.
4.NF.B.3.c Add and subtract mixed numbers with like denominators.
4.NF.B.3.d Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators.

## SMPs

MP 8

## Key Vocabulary

Equivalent fractions
Regroup

# Add Mixed Numbers

## Towards Mastery

- Find the sum. Add the fractional parts and then add the whole parts.

1) $6\frac{5}{10}+1\frac{7}{10}$

2) $3\frac{4}{6}+1\frac{3}{6}$

3) $2\frac{7}{8}+1\frac{3}{8}$

4) $3\frac{4}{6}+1\frac{3}{6}$

- Find the sum. Write each mixed number as a fraction, then add.

1) $4\frac{10}{12}+2\frac{3}{12}=$ _____

2) $3\frac{1}{8}+1\frac{5}{8}=$ _____

3) $4\frac{2}{6}+\frac{3}{6}=$ _____

## Mastery

- What is the sum?

1) $3\frac{5}{12}+4\frac{3}{12}=$ _____

2) $1\frac{3}{6}+1\frac{4}{6}=$ _____

3) $5\frac{3}{8}+4\frac{4}{8}=$ _____

- Marwa is finding the sum of $2\frac{5}{12}+1\frac{2}{12}$. She wrote her answer as shown below. Explain her thinking.

$$2+1=3$$

$$\frac{5}{12}+\frac{2}{12}=\frac{7}{12}$$

$$3+\frac{7}{12}=3\frac{7}{12}$$

## Beyond Mastery

- What are the possible missing number in the equation below?

□ □

1) $1\frac{\square}{5}+2\frac{\square}{5}=4\frac{1}{5}$

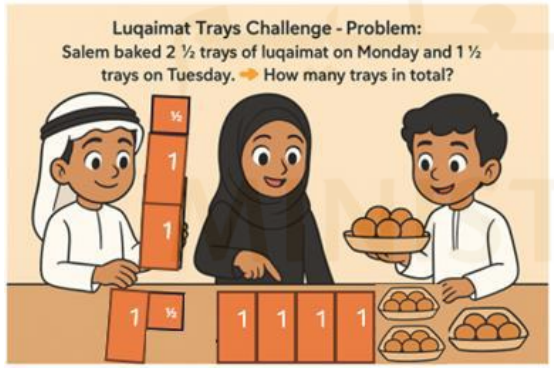
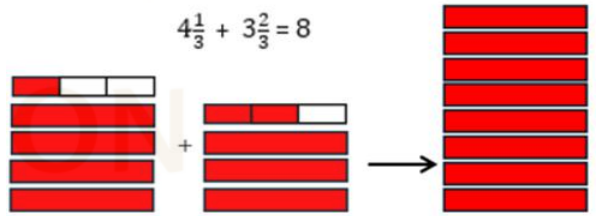
2) $2\frac{5}{\square}+1\frac{2}{\square}+\square=3$

$\frac{5}{12}+\frac{2}{12}=\frac{\square}{12}$

$\square+\frac{7}{12}=3\frac{7}{12}$

- Saif jogs $2\frac{1}{3}$ kilometers to the park. He jogs another $1\frac{2}{3}$ kilometers to meet a friend. How many kilometers did Saif jog in all? Explain how you found your answer.

# Add Mixed Numbers

| | Towards Mastery | Mastery | Beyond Mastery |
|---|---|---|---|
| Activity Title | Luqaimat Trays Challenge | Neighborhood Walk | UAE Flag Ribbon Project |
| Type of Activity | Hands-on | Visual model & drawing task | Collaborative group work |
| Summary of Activity | Problem: Salem baked 2 ½ trays of luqaimat on Monday and 1 ½ trays on Tuesday. How many trays in total?<br>• Students use fraction strips to represent 2 ½ and 1 ½.<br>• Students combine the wholes (2 + 1) and the halves (½ + ½).<br>• Students regroup if needed, using real "tray" cutouts or pictures.<br>• Students share how they found the total.<br>  | Problem: Fatima walked 3 ¾ km one day and 2 ¾ km another day. How far did she walk in all?<br>• Students draw bar models for 3 ¾ and 2 ¾.<br>• Students add the whole numbers first (3 + 2 = 5).<br>• Students then add fractions (¾ + ¾ = 1 ½).<br>• Students combine for total: 6 ½ km.<br>• Students discuss reasoning and confirm using number lines. | Problem: Salem has $4\frac{1}{3}$ meters of red ribbon and his friend Malik has $3\frac{2}{3}$ meters of red ribbon. What is the total length they both have?<br>• Students decide on a strategy: convert to improper fractions or decompose.<br>• Students apply chosen method.<br>• Students represent on a number line or model with paper ribbons.<br>• Students share reasoning and compare strategies with classmates.<br>  |

# Represent Subtracting Mixed Numbers

## Learning Objectives

By the end of the lesson, students will be able to represent subtraction of mixed numbers with like denominators using fraction models.

| Towards Mastery | Mastery | Beyond Mastery |
|---|---|---|
| • Students can represent subtraction of mixed numbers using models (e.g., fraction tiles, circles). | • Students can accurately represent subtraction of mixed numbers with like denominators using visual models or drawings. | • Students can represent and explain mixed number subtraction problems in multiple ways — using models, drawings, equations, and reasoning in real-world contexts. |

## Misconceptions and Notes

Students subtract whole numbers and fractions incorrectly.

## Basic Mathematical Skills

| Skill One | Skill Two |
|---|---|
| Understand and model fractions with like denominators.<br>Identify wholes and parts in a model. | Represent mixed numbers using visual models |

## Suggested Resources

Grade 4 Reveal Math Course 2, Teacher Edition e-Book, Volume 2
Lumenlearning.com

## Domain

Number & Operations—Fractions

## Standards

4.NF.B.3 Understand a fraction a/b with a > 1 as a sum of fractions 1/b.
4.NF.B.3.c Add and subtract mixed numbers with like denominators.
4.NF.B.3.d Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators.

## SMPs

MP 4

## Key Vocabulary

Difference
Mixed number

# Represent Subtracting Mixed Numbers

## Towards Mastery

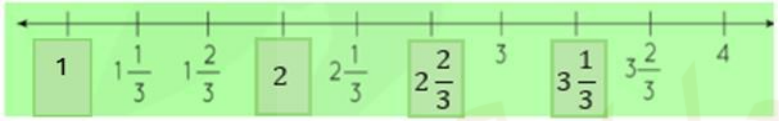
- Use fraction tiles or bars to show how you will solve each equation.

1) $2\frac{7}{8} - 1\frac{3}{8}$

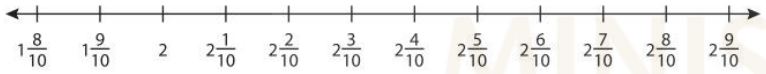
2) $3\frac{4}{6} - 1\frac{3}{6}$

- Use number lines to show how you will solve each equation.

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



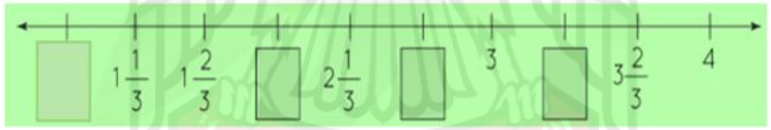

2) $2\frac{9}{10} - 1\frac{1}{10}$



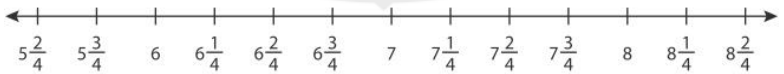

## Mastery

- Represent the equations using the number line.

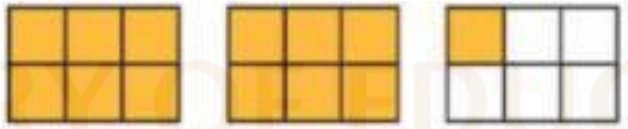
1) $2\frac{2}{3} - 1\frac{1}{3}$




2) $8\frac{2}{4} - 2\frac{3}{4}$

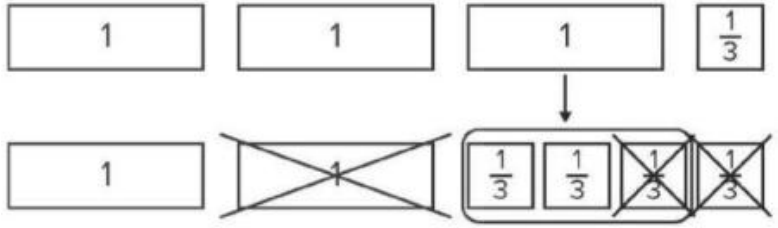



- How can you use the fraction model below to solve $2\frac{1}{6} - 1\frac{3}{6}$?



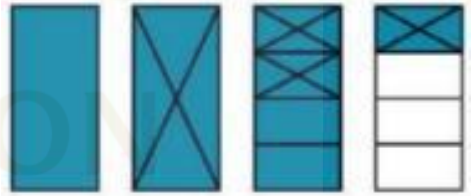
## Beyond Mastery

- Write the subtraction equation represented with the fraction bars below.

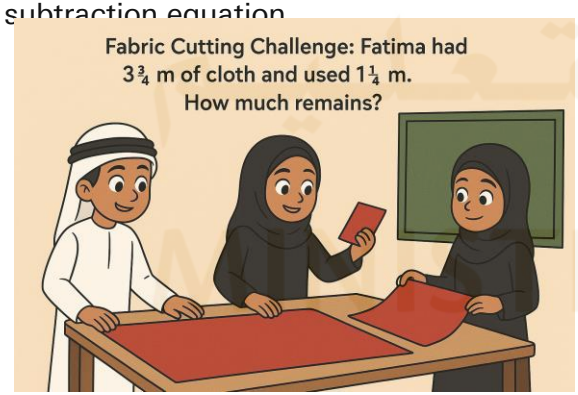
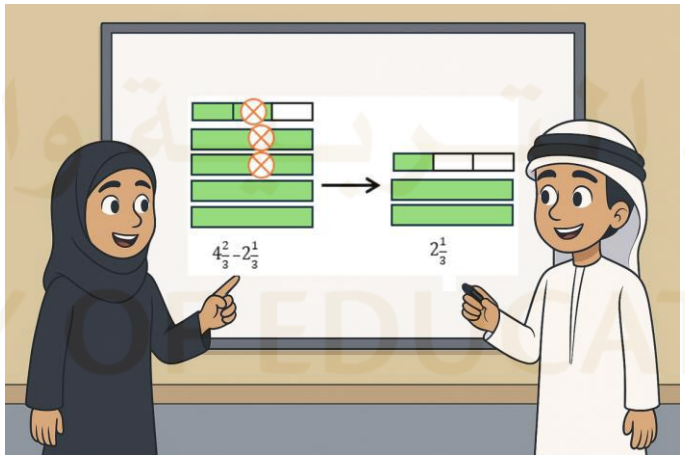



_____ − _____ = _____

- Rashed had $3\frac{1}{4}$ litres of juice and served $1\frac{3}{4}$ litres to his guest. How much juice remains? Write your subtraction equation and show your fraction tile model to explain your thinking.



# Represent Subtracting Mixed Numbers

| | Towards Mastery | Mastery | Beyond Mastery |
|---|---|---|---|
| Activity Title | Fabric Cutting Challenge | Kunafa Tray Task | Mixed Numbers Bingo |
| Type of Activity | Hands-on | Model Drawing | Subtraction Fluency Game |
| Summary of Activity | Problem: Fatima had 3¾ m of cloth and used 1¼ m. How much cloth remains?<br>• Each group receives fraction strips labelled in fourths.<br>• Students model 3 wholes and ¾, then physically remove 1¼.<br>• Students compare remaining parts and record answers.<br>• Discuss strategies and check using subtraction equation.<br>  | Problem: "Hamad baked 4 ⅔ trays of kunafa. His cousins ate 2 ⅓ trays. How much is left?"<br>• Draw bar models (4⅔ - 2⅓).<br>• Shade parts to visualize subtraction.<br>• Subtract whole numbers and fractions separately.<br>• Compare group solutions and discuss equivalence.<br>  | • Distribute 3×3 bingo cards to students.<br>• Teacher calls out answers in random order.<br>• Students cross-out the subtraction problem whose answer is called out.<br>• First student to complete a row, column, or diagonal shouts "Bingo!" and must explain one problem where regrouping was required.<br><br>7¼ – 2¾ \| 4⅔ – 2⅓ \| 6⅞ – 5⅜<br>3¾ – 2¼ \| FREE SPACE \| 7¾ – 5¼<br>2½ – 1½ \| 8⅝ – 5⅛ \| 2¼ – 1¾ |

# Subtract Mixed Numbers

## Learning Objectives

By the end of the lesson, students will be able to subtract mixed numbers using strategies such as using equivalent fractions and related addition equations.

| Towards Mastery | Mastery | Beyond Mastery |
|---|---|---|
| • Students can subtract mixed numbers with like denominators when no regrouping is needed.<br>• Students can use fraction bars or tiles, number lines to visualize subtraction. | • Students can fluently subtract mixed numbers with like denominators, whether or not regrouping is required.<br>• Students can connect visual models to symbolic subtraction and can use related addition equations to check their work. | • Students can apply their understanding to solve real-world problems involving mixed numbers. |

## Misconceptions and Notes

- Students subtract whole numbers but forget to subtract fractions.

## Basic Mathematical Skills

| Skill One | Skill Two |
|---|---|
| Understand equivalence of fractions | Subtract fractions with like denominators.<br>Use equivalent fractions and relate subtraction to addition. |

## Suggested Resources

Grade 4 Reveal Math Course 2, Teacher Edition e-Book, Volume 2
Amplify.com
Cuemath.com

## Domain

Number & Operations—Fractions

## Standards

4.NF.B.3 Understand a fraction a/b with a > 1 as a sum of fractions 1/b.
4.NF.B.3.c Add and subtract mixed numbers with like denominators.
4.NF.B.3.d Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators.

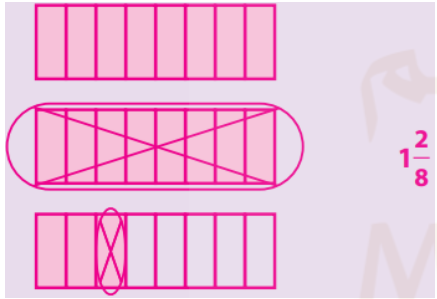
## SMPs

MP 7

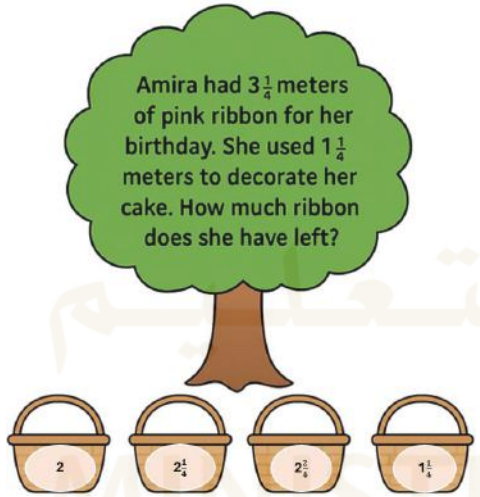
## Key Vocabulary

Equivalent fraction

# Subtract Mixed Numbers

| Towards Mastery | Mastery | Beyond Mastery |
|---|---|---|
| • What is the difference in each equation?<br>1) $4\frac{10}{12} - 2\frac{3}{12} =$ _____<br>2) $3\frac{1}{8} - 1\frac{5}{8} =$ _____<br>3) $4\frac{2}{6} - \frac{3}{6} =$ _____<br>• What is the missing mixed fraction in the equation below. Use the model to help you?<br>  <br><br>$2\frac{3}{8} -$ _____ $= 1\frac{2}{8}$ | • What are the possible missing numbers?<br>$3\frac{?}{8} - 2\frac{?}{8} = \square\frac{6}{8}$<br>• Solve the following. Use picture or number line to show your work.<br>1) $5\frac{3}{3} - 1\frac{1}{3} = ?$<br>2) $2\frac{9}{12} - 1\frac{5}{12} = ?$<br>3) $4\frac{4}{10} - 2\frac{5}{10} = ?$<br>4) $6\frac{1}{8} - 3\frac{2}{8} = ?$ | • Find the missing numbers that will show how to subtract $5\frac{2}{5} - 1\frac{4}{5}$.<br>$\square\frac{27}{} - \frac{\square}{5} = \frac{\square}{5}$<br>• Use related addition equation to subtract $2\frac{1}{6} - 1\frac{3}{6}$.<br>$1\frac{3}{6} + p = 2\frac{1}{6}$. What is p?<br>• What is the subtraction equation in the model below?<br>  <br>_____ – _____ = _____ |

# Subtract Mixed Numbers

| | Towards Mastery | Mastery | Beyond Mastery |
|---|---|---|---|
| Activity Title | Birthday Ribbon Subtraction | Juice Shop Challenge | Running Distance |
| Type of Activity | Hands-on | Group Work | Real-Life Application |
| Summary of Activity | Amira's friends solved the problem in the fraction tree. Their answers are shown in the answer baskets below the tree.<br>  <br>▪ Choose the correct answer basket.<br>▪ Explain how you figured it out | • Omar had $3\frac{1}{8}$ litres of juice and served $1\frac{5}{8}$ litres. How much juice is left?<br>• Students draw juice bottles to represent mixed numbers.<br>• Use regrouping when fractional part is smaller.<br>• Show subtraction both visually and numerically.<br>  | Problem: Aisha ran $6\frac{1}{4}$ km in the morning and $3\frac{3}{4}$ km in the evening. How much farther did she run in the morning than in the evening?<br>• Model subtraction using a number line or fraction bars.<br>• Convert fractions to equivalent forms for easy subtraction.<br>• Discuss reasoning with peers and share different approaches. |

# Solve Problems Involving Mixed Numbers

## Learning Objectives

By the end of the lesson, students will be able to represent and solve word problems involving addition and subtraction of mixed numbers with like denominators.

| Towards Mastery | Mastery | Beyond Mastery |
|---|---|---|
| • Students can identify mixed numbers and attempt to represent problems but need support to connect the context to mathematical operations. | • Students can correctly represent and solve addition/subtraction problems with like denominators, interpreting their answers in real contexts. | • Students can flexibly solve mixed-number problems using multiple strategies (decomposing, converting, or mental math) and justify their reasoning. |

## Misconceptions and Notes

- Students subtract fractions incorrectly when the fractional part of the minuend is smaller.

## Basic Mathematical Skills

| Skill One | Skill Two |
|---|---|
| Adding and subtracting fractions with like denominators. | Applying fraction operations to real-life contexts. |

## Suggested Resources

Grade 4 Reveal Math Course 2, Teacher Edition e-Book, Volume 2
Mixed Fraction Addition worksheet
Problem Solving Resource

## Domain

Number & Operations—Fractions

## Standards

4.NF.B.3 Understand a fraction a/b with a > 1 as a sum of fractions 1/b.
4.NF.B.3.d Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators.

## SMPs

MP 6

## Key Vocabulary

Bar diagram
Variable

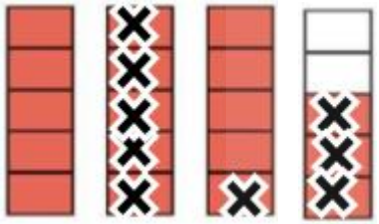
# Solve Problems Involving Mixed Numbers

## Towards Mastery

- On Friday, Shamsa used $3\frac{4}{8}$ cups of flour. On Saturday, she used $3\frac{6}{8}$ cups of flour. What is the total amount of flour that Shamsa used on Friday and Saturday? Fill in to complete the equation.

_____ + _____ = _____

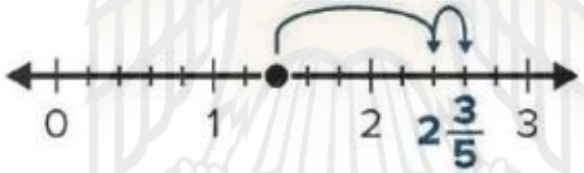
- What is the fraction equation for this model?



_____ ☐ _____ = _____

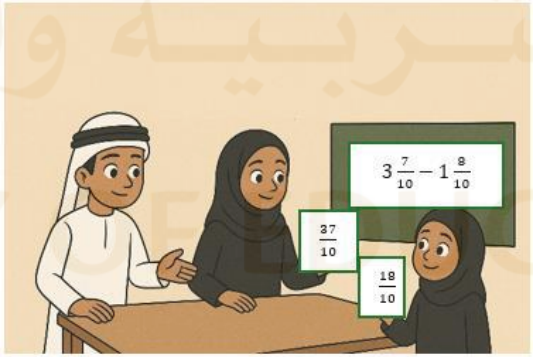
## Mastery

- What is the fraction equation for this model?




_____ ☐ _____ = _____

- Yusef hiked $3\frac{7}{10}$ kilometres on Friday. He hiked $1\frac{8}{10}$ kilometres lesser on Saturday than on Friday. What distance did Yusef hike on Saturday?



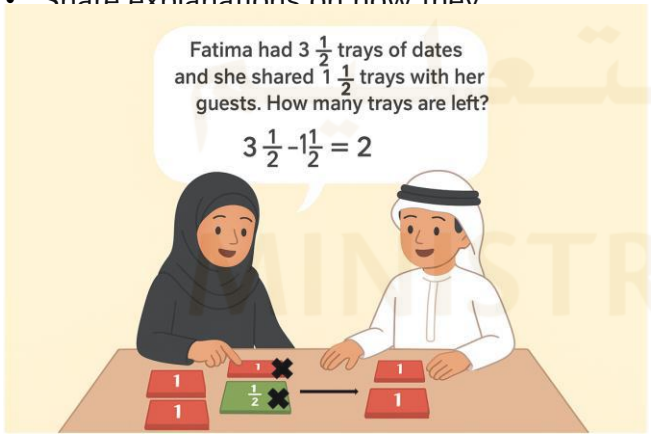
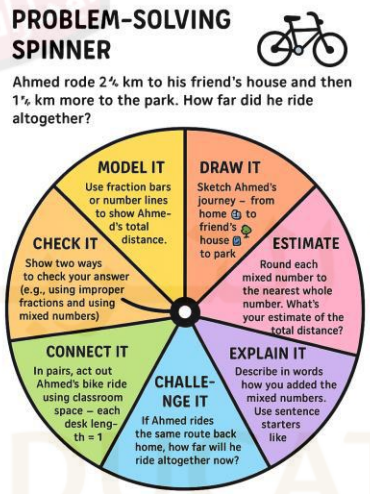

## Beyond Mastery

- Hind has $3\frac{4}{5}$ bags of soil. She used some of the soil. Now she has $1\frac{3}{5}$ bags left. How much soil did Hind use?

- A rectangular picture frame has a length of $5\frac{3}{8}$ inches and a width of $4\frac{3}{8}$ inches. What is the perimeter of the picture fram[illegible] $5\frac{3}{8}$ in ain your reasoning.

$4\frac{3}{8}$ in

# Solve Problems Involving Mixed Numbers

| | Towards Mastery | Mastery | Beyond Mastery |
|---|---|---|---|
| Activity Title | Date Tray Sharing | Biking Around the Park | Coconut Juice for the Family |
| Type of Activity | Hands-on | Word Problem | Collaborative work |
| Summary of Activity | Problem: Fatima had 3½ trays of dates. She shared 1½ trays with visitors. How many trays are left?<br>• Students use fraction circles or paper strips to model 3½ and remove 1½.<br>• Discuss: "How much of the trays are left?"<br>• Record using equation: 3½ – 1½ = 23½ – 1½ = 2.<br>• Share explanations on how they<br>  | Problem: Ahmed rode 2¾ km to his friend's house and then 1¼ km more to the park. How far did he ride altogether?<br>▪ Students spin once pe round in pairs or small groups.<br>▪ After responding, they share answers and compare strategies.<br>Discussion<br>▪ What strategy helped you most today?<br>▪ Was estimating or exact calculation easi Why?<br>▪ Which spinner sectior made you think differently about the problem?<br>  | Problem: Ms Zainab used 4⅔ litres of juice for school lunch and 2⅓ litres for dinner. How much juice was used in total?<br>• Each student fills in the blanks below.<br>Ms Zainab used ____ litres for lunch and ____ litres for dinner.<br>To find the total, we add the ____ and the ____.<br>The total juice used is ____ litres.<br>• Turn and Talk- students face a partner and take turns to ex in.<br>• Peer feedback- partners give each other quick feedback.<br>  |

# Addition and Subtraction Strategies with Mixed Numbers

❖ This section aims to assess how well students have mastered the module objectives upon completion of the module.

| Question Number | Question | DOK Level | Standard | SMPs |
|---|---|---|---|---|
| 1 | Decompose $4\frac{3}{8}$ into a sum of whole numbers and unit fractions. | 1 | 4.NF.B.3b | SMP 2, 6, 7 |
| 2 | Write $2\frac{1}{4} + 3\frac{2}{4}$ as a sum of wholes and fractions. Then find the total. | 2 | 4.NF.B.3c | SMP 1, 2, 6, 8 |
| 3 | Aisha baked $3\frac{1}{2}$ pans of brownies. She gave away $1\frac{3}{2}$ pans. How many pans remain? | 3 | 4.NF.B.3d | SMP 1, 2, 4, 6 |
| 4 | Prove that adding $2\frac{3}{4} + 1\frac{1}{2}$ gives the same result as adding improper fractions ($\frac{11}{4} + \frac{6}{4}$) and converting back to a mixed number. | 4 | 4.NF.B.3c | SMP 1, 2, 3, 4, 7, 8 |
| 5 | Khalid spent $2\frac{1}{4}$ hours studying on Saturday and $1\frac{3}{4}$ hours on Sunday. He planned to study 5 hours total. How many more hours does he need to study for? | 4 | 4.NF.B.3d | SMP 1, 2, 4, 6 |