Instructional Context

This lesson plan is designed to teach operations with mixed fractions in alignment with the Grade 7 Alberta Mathematics Curriculum. The lesson focuses on applying addition and subtraction operations to mixed fractions, including working with fractions that have both like and unlike denominators.

It is assumed that students have already been introduced to the mixed fractions unit in a previous lesson, where they learned how to:

- compare mixed and improper fractions, and
- convert between improper fractions and mixed fractions.

This lesson builds upon those previously taught concepts by introducing operations with mixed fractions and guiding students toward a deeper conceptual understanding of how fraction operations work. Students first review prerequisite knowledge before applying addition and subtraction to mixed fractions, progressing from fractions with like denominators to fractions with unlike denominators, where they must apply the concept of the lowest common multiple (LCM) to obtain a common denominator.

The lesson emphasizes conceptual reasoning, visual representations, and step-by-step problem solving to support student comprehension and strengthen foundational fraction skills.

Learning Objectives

- review previously taught concepts: BEDMAS (math operations) and LCM
- apply addition and subtraction to simplify fraction expressions
- apply LCM to simplify fraction expressions with unlike denominators

Instructional Design Notes

This lesson plan was built from the notes used in a previous tutoring session. In the actual session, the student was already taught the concepts in class and we spent the session refining comprehension and practice.

This lesson plan was refined and designed from a perspective of teaching this content to a student for the first time.

Student FAQs are real FAQs from the session.

Lesson Plan

Date: March 9, 2026

Grade: 7

Subject: Math

Lesson Topic: BEDMAS with Mixed Fractions (Addition and Subtraction)

Learning Objective/s:

→ apply math operations (BEDMAS) to expressions containing mixed fractions
→ adding/subtraction fractions with like denominators
→ adding/subtracting fractions with unlike denominators
- review and apply concept : lowest common multiple (LCM)

Materials Needed:

→ whiteboard + markers
→ calculator (if necessary)
→ phone/smart device → to play Kahoot!

Hook/intro:

Kahoot! review :

→ converting improper fractions into mixed fractions
→ Simplifying fractions

Lesson structure:

processes work in reverse

→ Review BEDMAS
- what is BEDMAS?
- addition and subtraction (+/–) are inverse operations
  - ↳ compare +/– of whole integers to fractions

→ +/– fractions with like denominators
- +/– simple fractions
- +/– mixed fractions w/ whole numbers

→ +/– fractions with unlike denominators
- visual image to understand what this looks like
- use LCM to convert unlike denominators to like denominators
  - ↳ review LCM
  - ↳ critical thinking question: is the multiplier applied to the whole number of a mixed fraction?

Closure:

→ provide homework set for student to practice independently

Notes:

→ student comprehension check-in symbol:
→ applying operations to mixed fractions only includes positive integers for this session

Review from Last Session

interactive assessment : Kahoot!

topics :
→ mixed fraction vs improper fraction
→ conversion of fractions :
• improper → mixed
• mixed → improper

check in on student comprehension

Review BEDMAS

Brackets
Exponenents
Division
Multiplication
Addition
Subtraction

→ Focus for today :
→ addition (+) → combining 2 quantities together
→ subtraction (−) → the difference when removing one portion from a larger quantity

+/− of Fractions w/ Like Denominators

* note : +/− can only be used of quantities that are defined in the same group

ie. whole numbers : $2 + 3 = 5$ ← this expression can be simplified b.c. both quantities are whole numbers

ie. fractions : $\frac{2}{1} + \frac{3}{1} = \frac{5}{1}$ ← this expression can be simplified b.c. both fractions have the same denominator

ie. variables : $x + y = x + y$ ← this expression cannot be simplified b.c. these unknown variables are defined differently

∴ fractions can be +/− from each other when they have the same denominator

ie. $\frac{1}{6} + \frac{3}{6} = \frac{1+3}{6} = \frac{4}{6} = \frac{2}{3}$

correct answer
simplified correct answer
} I would take both of these as correct on a test

ie. $\frac{7}{8} - \frac{4}{8} = \frac{7-4}{8} = \frac{3}{8}$

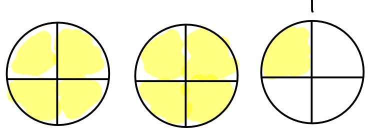
ie. $2\frac{5}{7} + 1\frac{4}{7} = \underbrace{(2+1)\ \frac{5+4}{7}} = 3\frac{9}{7} = 4\frac{2}{7}$

tip : when adding mixed fractions, you can add the whole numbers and fractions independently

ie. $2\frac{1}{4} - 1\frac{3}{4} = 1\frac{4+1}{4} - 1\frac{3}{4} = (1-1)\ \frac{5-3}{4} = \frac{2}{4} = \frac{1}{2}$

↳ remember : whole numbers of mixed fractions = 1 filled fraction

$2\frac{1}{4} = \frac{(2\times4)+1}{4} = \frac{8+1}{4} = \frac{9}{4}$



visual representation

student practice :

1) $\frac{9}{13} + \frac{8}{13}$ 2) $5\frac{10}{11} - 3\frac{7}{11}$ 3) $8\frac{9}{10} + 2\frac{6}{10}$ 4) $2\frac{1}{10} - \frac{8}{10}$

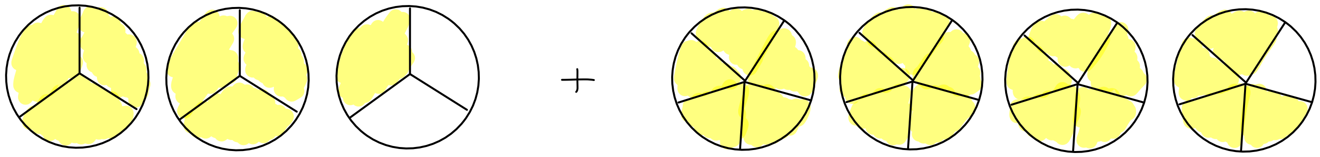
check in on student comprehension

+/- of Fractions w/ Unlike Denominators

question: what happens if an expression has fractions w/ different denominators?

ie. $2\frac{1}{3} + 3\frac{4}{5}$

visual representation:



problem: these values can't be combined as is b.c. these pieces aren't the same size

solution: convert the fractions so the pieces are the same size (find a common denominator)

Review: Lowest Common Multiple (LCM)

LCM → the smallest possible integer divisible by all of the integers

→ LCM can be applied to fractions to make denominators the same

- LCD: lowest common denominator

∴ unlike denominators become like denominators and can simplify fraction expressions

ie. $\left(2\frac{1}{3}\right)^{\times 5} + \left(3\frac{4}{5}\right)^{\times 3}$

LCD
$3 = 3\times 1$
$5 = 5\times 1$
$\}$ $LCD = 3\times 5 = 15$

$= 2\frac{5}{15} + 3\frac{12}{15} = (2+3)\frac{12+5}{15} = 5\frac{17}{15} = 6\frac{2}{15}$

tip for calculating LCD:

→ if denominator is a prime number: directly multiply to find LCD

ie. $4\frac{3}{7} - 2\frac{1}{5}$

LCD:
$7 = 7\times 1$
$5 = 5\times 1$
$\}$ $LCD = 7\times 5 = 35$

→ if denominator is a composite number: multiply the highest exponential factors of the denominators

ie. $4\frac{2}{9} + 2\frac{1}{15}$

LCD:
$9 = 3\times 3\times 1 = 3^2$
$15 = 3\times 5$
$\}$ $LCD = 3^2\times 5 = 45$

$\frac{45 \div 9}{5}$ $\frac{45 \div 15}{3}$

ie. $1\frac{1}{2} - 1\frac{1}{4}$

LCD:
$2 = 2\times 1$
$4 = 2\times 2\times 1 = 2^2$
$\}$ $LCD = 2^2 = 4$

student FAQ: can I directly multiply composite numbers to find a common denominator?

answer: Yes, you can. BUT watch your arithmetics – this is where most mistakes happen!

$LCD = 45$

with LCD

ie. $\left(4\frac{2}{9}\right)^{\times 5} + \left(2\frac{1}{15}\right)^{\times 3} = 4\frac{10}{45} + 2\frac{3}{45} = (4+2)\frac{10+3}{45} = 6\frac{13}{45}$

with direct multiplication ie. $\left(4\frac{2}{9}\right)^{\times 15} + \left(2\frac{1}{15}\right)^{\times 9} = 4\frac{30}{135} + 2\frac{9}{135} = (4+2)\,\frac{30+9}{135} = 6\frac{39}{135} = 6\frac{13}{45}$

student FAQ : why is the multiplier not applied to the whole number of a mixed fraction?

answer : actually, it is. BUT the ratio stays the same, so the whole number stays the same

ie. $1\frac{1}{2} - 1\frac{1}{4} = \left(\frac{1\times 2}{2} + \frac{1}{2}\right)^{\times 2} - 1\frac{1}{4} = \left(\frac{4}{4} + \frac{2}{4}\right) - 1\frac{1}{4} = 1\frac{2}{4} - 1\frac{1}{4} = (1-1)\,\frac{2-1}{4} = \frac{1}{4}$ LCD = 4

check in on student comprehension

END OF LESSON

Homework Set :

1. evaluate the following expressions. Simplify where possible :

a) $\frac{2}{5} + \frac{4}{5}$

b) $1\frac{3}{6} + 2\frac{5}{6}$

c) $4\frac{5}{8} - 3\frac{3}{8}$

d) $8\frac{1}{4} - 2\frac{3}{4}$

e) $7\frac{6}{7} - 6\frac{2}{7}$

f) $\frac{42}{8} + \frac{89}{7}$

g) $9\frac{7}{8} - 3\frac{2}{4}$

h) $5\frac{7}{41} + 12\frac{1}{10}$

i) $14\frac{97}{128} - 8\frac{15}{16}$