Objectives:
- Students will memorize the multiplication table, as evidenced by them passing "minute quizzes."
- Students will multiply mixed numbers by converting them to improper fractions and then multiplying, as evidenced by them completing a warm-up worksheet where they do so.
- Students will divide fractions (including whole numbers and mixed numbers) as evidenced by them completing a homework assignment where they do so.

Student Materials on Desk Corner:
- Homework #2-12
- Homework Checker
- Readiness Checker

Student Materials for Class:
- Homework Log
- Binder Paper
- Pencils

Teacher Materials:
- "Warm-up 2-13" for each student
- "Minute Quiz 2-13" for each student
- "Homework #2-12" answer key and grading roster for TA
- "Homework #2-13" handout for each student

Homework:
- Homework #2-13

Time	Activity
Before Bell	**DO NOW** As students enter the classroom, shake hands and give them a copy of the **warm-up**. Remind students that there is a minute quiz, so students need to be seated quietly with a pencil when the bell rings.
5 min	**MINUTE QUIZ, HOMEWORK COLLECTION, AND WARM-UP** **Minute Quiz** When the bell rings, quickly go around and put the **minute quiz** on each student's desk, facedown. Then, start everyone on the quiz at the same time and give everyone one minute. While students are working on the quiz, stamp the **readiness checkers** of students who were ready when the bell rang and had their readiness checkers out. **Homework Collection** Instruct the TA go around and collect **homework** and stamp **homework checkers**. Give the TA the answer key and have him or her grade the homework that was collected. **Warm-up** After the minute quiz, students should work on the **warm-up** while you take **attendance**.
35 min	**LESSON: DIVIDING FRACTIONS** **Notes** Follow the handwritten Cornell Notes. **Homework** Pass out the ""Homework #2-13" handout and have students write down the assignment on their homework logs.
40 min	**ALEKS** Students should continue with **ALEKS**. Use this student work time to **return graded homework**.

Numeracy
Minute Quiz 2-13 A

Name:
Date: Period:

Solve the following multiplication problems. You have exactly one minute!

4 • 3 =   5 • 7 =   12 • 4 =

8 • 7 =   11 • 2 =   9 • 5 =

8 • 8 =   7 • 4 =   3 • 6 =

3 • 12 =   1 • 1 =   9 • 10 =

Numeracy
Minute Quiz 2-13 B

Solve the following multiplication problems. You have exactly one minute!

$9 \cdot 8 =$ $4 \cdot 7 =$ $9 \cdot 7 =$

$2 \cdot 8 =$ $10 \cdot 3 =$ $4 \cdot 8 =$

$8 \cdot 10 =$ $4 \cdot 8 =$ $8 \cdot 5 =$

$9 \cdot 7 =$ $3 \cdot 8 =$ $3 \cdot 6 =$

Numeracy   Name:
Minute Quiz 2-13 C   Date: Period:

Solve the following multiplication problems. You have exactly one minute!

12 • 8 =   2 • 12 =   4 • 7 =

1 • 1 =   2 • 2 =   3 • 9 =

7 • 11 =   7 • 7 =   6 • 12 =

6 • 10 =   11 • 12 =   7 • 12 =

Multiply the following special fractions. Remember to simplify your answers.

1) $2\dfrac{1}{4}\cdot\dfrac{6}{7}$

2) $8\cdot 1\dfrac{1}{2}$

Dividing Fractions

Section → __Reciprocal of a Fraction__

reciprocal   The __reciprocal__ of a fraction is what you get when you flip the fraction upside-down. This means the numerator and denominator are swapped.

Ex: The reciprocal of $\frac{3}{4}$ is $\frac{4}{3}$.
    "   "   " $\frac{2}{5}$ " $\frac{5}{2}$.
    "   "   " $\frac{9}{7}$ " $\frac{7}{9}$

Ex: Find the reciprocal of $2\frac{1}{3}$.
First, turn it into an improper fraction.
$$2\frac{1}{3} = \frac{2\cdot3+1}{3} = \frac{6+1}{3} = \frac{7}{3}$$
So, the reciprocal is $\boxed{\frac{3}{7}}$.

Section → __Dividing Fractions__

how to   To divide two fractions, you find the reciprocal of the second
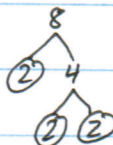divide fractions   fraction, then multiply and simplify.

Ex: Evaluate $\frac{1}{8} \div \frac{1}{4}$.

$$\frac{1}{8} \div \frac{1}{4} = \frac{1}{8} \cdot \frac{4}{1} = \frac{4}{8}$$
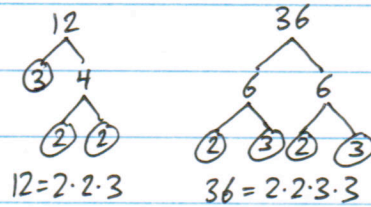
reciprocal

$4 = 2\cdot2$

$8 = 2\cdot2\cdot2$

$$\frac{4}{8} = \frac{2 \cdot 2}{2 \cdot 2 \cdot 2} = \boxed{\frac{1}{2}}$$

Ex: Evaluate $\frac{2}{9} \div \frac{4}{6}$.

$$\frac{2}{9} \div \frac{4}{6} = \frac{2}{9} \cdot \frac{6}{4} = \frac{2 \cdot 6}{9 \cdot 4} = \frac{12}{36}$$

reciprocal

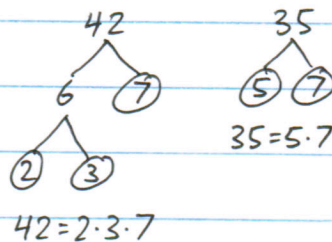$12 = 2 \cdot 2 \cdot 3$ $36 = 2 \cdot 2 \cdot 3 \cdot 3$

$$\frac{12}{36} = \frac{2 \cdot 2 \cdot 3}{2 \cdot 2 \cdot 3 \cdot 3} = \boxed{\frac{1}{3}}$$

Ex: Evaluate $2\frac{4}{5} \div 2\frac{1}{3}$.

$$2\frac{1}{3} = \frac{2 \cdot 3 + 1}{3} = \frac{6+1}{3} = \frac{7}{3}$$

$$2\frac{4}{5} = \frac{2 \cdot 5 + 4}{5} = \frac{10+4}{5} = \frac{14}{5}$$

$$\frac{14}{5} \div \frac{7}{3} = \frac{14}{5} \cdot \frac{3}{7} = \frac{42}{35}$$

$35 = 5 \cdot 7$

$42 = 2 \cdot 3 \cdot 7$

$$\frac{42}{35} = \frac{2 \cdot 3 \cdot 7}{5 \cdot 7} = \frac{2 \cdot 3}{5} = \frac{6}{5}$$

$$5 \overline{)6} \quad \Rightarrow \quad \frac{6}{5} = \boxed{1\frac{1}{5}}$$
$$\underline{-5}$$
$$1$$

Dividing Fractions

Turn the the second fraction upside down, then just multiply.

There are 3 Simple Steps to Divide Fractions:

Step 1. Turn the second fraction *(the one you want to divide by)* upside-down (this is now a reciprocal).

Step 2. Multiply the first fraction by the **reciprocal** of the second.

Step 3. Simplify the fraction (if needed)

Example 1

$$\frac{1}{2} \div \frac{1}{4}$$

Step 1. Turn the second fraction upside-down (the **reciprocal**):

$$\frac{1}{4} \quad \longrightarrow \quad \frac{4}{1}$$

Step 2. Multiply the first fraction by the **reciprocal** of the second:

$$\frac{1}{2} \times \frac{4}{1} = \frac{1 \times 4}{2 \times 1} = \frac{4}{2}$$

Step 3. Simplify the fraction:

$$\frac{4}{2} = \mathbf{2}$$

(If you are unsure of the last step see the equivalent fractions page)

Example 2

$$\frac{1}{8} \div \frac{1}{4}$$

Step 1. Turn the second fraction upside-down (the **reciprocal**):

$$\frac{1}{4} \quad \longrightarrow \quad \frac{4}{1}$$

Step 2. Multiply the first fraction by the **reciprocal** of the second:

$$\frac{1}{8} \times \frac{4}{1} = \frac{1 \times 4}{8 \times 1} = \frac{4}{8}$$

Step 3. Simplify the fraction:

$$\frac{4}{8} = \frac{1}{2}$$

Why Turn the Fraction Upside Down?

Simply because division is the "inverse" or opposite of multiplying.

- Multiplying by 5 makes something 5 times bigger.
- Dividing by 5 makes something 5 times smaller.

A fraction has both multiply and divide in it ... you multiply by the top number and divide by the bottom number.

> Example: $^3/_4$
>
> That means to cut into 4 pieces, and then take 3 of those.
>
> So you divide by 4 then multiply by 3.
>
> So 100 × $^3/_4$ is 100 divided by 4 *(=25)* then multiplied by 3 *(=75)*.

NOW if you have to DIVIDE by a fraction, you are asked to do the **opposite of multiply** ... so

- multiply becomes divide, and
- divide becomes multiply,

SO $^3/_4$ becomes $^4/_3$

> Example: 75 / ($^3/_4$) is also 75 × ($^4/_3$), which is 75 divided by 3 *(=25)* then multiplied by 4 *(=100)*

Note: **100** × ($^3/_4$) = 75, and if we then DIVIDE 75 by ($^3/_4$), which is the same as multipling 75 by ($^4/_3$), you get back to **100 again**.

here's more ...

Divide the following fractions by finding the reciprocal of the second fraction and then multiplying and simplifying.

Ex.) $\dfrac{2}{9} \div \dfrac{4}{6}$

Multiply by the reciprocal of the second fraction:

$\dfrac{2}{9} \div \dfrac{4}{6} = \dfrac{2}{9} \cdot \dfrac{6}{4} = \dfrac{2 \cdot 6}{9 \cdot 4} = \dfrac{12}{36}$

Now, simplify:

$\dfrac{12}{36} = \dfrac{2 \cdot 2 \cdot 3}{2 \cdot 2 \cdot 3 \cdot 3} = \dfrac{1}{3}$

1) $\dfrac{2}{3} \div \dfrac{1}{6}$

2) $\dfrac{3}{4} \div \dfrac{5}{12}$

3) $\dfrac{1}{5} \div 2\dfrac{3}{5}$

4) $\dfrac{8}{9} \div \dfrac{2}{3}$

5) $\dfrac{4}{5} \div 8$

6) $1\dfrac{3}{5} \div \dfrac{6}{7}$

7) $\dfrac{5}{6} \div 1\dfrac{2}{3}$

8) $2 \div \dfrac{1}{2}$

9) $4\dfrac{1}{5} \div \dfrac{7}{10}$

10) $2\dfrac{4}{5} \div 1\dfrac{3}{4}$

11) $1\dfrac{3}{4} \div 2\dfrac{2}{7}$