Lesson 5-2 – Ratios and Proportions

Objectives:

- Students will divide positive integers from the multiplication table without remainders, as evidenced by them passing one-minute quizzes.
- Students will find equivalent fractions, as evidenced by them completing a warm-up worksheet where they do so.
- Students will find ratios between quantities, as evidenced by them completing a homework assignment where they do so.
- Students will solve proportions that contain a variable, as evidenced by them completing a homework assignment where they do so.
- Students will determine whether two ratios form a proportion, as evidenced by them completing a homework assignment where they do so.

Materials:

- Unit calendar transparency
- Minute Quiz 5-2
- Warm-up 5-2
- Notes #5-2 and Homework #5-2 (front and back)
- Notes #5-2 Teacher's Edition
- Sample poster, poster paper, and markers

Do Now:

- Park stuff
- Work on warm-up
- Get ready for minute quiz

Homework:

- Homework #5-2
- 7 hours of ALEKS due Friday

Time	Activity
Before Bell	**AGENDA, DO NOW, AND WARM-UPS** Write the **agenda** and the **do now** on the board. As students enter the classroom, shake their hands and direct them to follow the directions listed for the "do now."
10 min	**MINUTE QUIZ, WARM-UP, ATTENDANCE, AND HOMEWORK COLLECTION** **Minute Quiz and Warm-up** When the bell rings, quickly go around and put the **minute quiz** on each student's desk, face down. Then, start everyone on the quiz at the same time and give everyone one minute. Students should work on the warm-up when they're done with the minute quiz. After the minute is over, have a student collect the minute quizzes and give them to the teacher's aide (TA) to grade. **Attendance and Collect Homework** While students work on the warm-up, take **attendance** and have the TA collect **homework** & stamp homework checkers.
5 min	**ANNOUNCEMENTS** Explain to students that you have a couple announcements to make. **ALEKS** Ask students, *The first announcement has to do with ALEKS. This week, how many hours of ALEKS do you need to have by Friday?* Point to the homework assignment that indicates the answer. *[Seven.] Again, we're just adding one hour a week.* **Unit Overview** *The second announcement is to describe what we're doing this unit. This year, we've talked about integers, fractions, decimals, polynomials, and now we're going to learn about percents.* Put the unit calendar transparency on the overhead. Describe the various lessons in the unit.
25 min	**LESSON: RATIOS AND PROPORTIONS** Go through "Notes 5-2." Afterwards, have the TA go around and stamp warm-up & notes checkers.

35 min	**POSTERS & ALEKS** **Posters** Have students pair up and create a poster that solves problem 4, 5, 6, 7, or 8 on the homework assignment. Show students a sample poster. This is to ensure that students will be able to do the rest of the problems before they leave class. **ALEKS** When students finish their classwork, they should work with **ALEKS**. Use this student work time to **return graded homework**.
5 min	**CLEAN UP** Students must check the laptops with the teacher or the TA before putting them away. After putting the laptops away, students should pack up, sit in their seats, and wait to be dismissed by the teacher (not by the bell). Make sure students push in their chairs as they leave.

Numeracy
Minute Quiz 5-2 A

Name:
Date: Period:

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

7 ÷ 7 =	8 ÷ 8 =	40 ÷ 5 =
54 ÷ 9 =	40 ÷ 8 =	6 ÷ 6 =
60 ÷ 12 =	49 ÷ 7 =	6 ÷ 3 =
10 ÷ 2 =	90 ÷ 9 =	49 ÷ 7 =

Numeracy
Minute Quiz 5-2 A

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Date: Period:

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10 ÷ 2 =	90 ÷ 9 =	49 ÷ 7 =

Numeracy
Minute Quiz 5-2 B

Name:
Date: Period:

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

84 ÷ 7 =	12 ÷ 4 =	7 ÷ 1 =
63 ÷ 9 =	54 ÷ 9 =	8 ÷ 2 =
55 ÷ 11 =	24 ÷ 8 =	10 ÷ 10 =
18 ÷ 3 =	18 ÷ 6 =	88 ÷ 11 =

Numeracy
Minute Quiz 5-2 B

Name:
Date: Period:

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

84 ÷ 7 =	12 ÷ 4 =	7 ÷ 1 =
63 ÷ 9 =	54 ÷ 9 =	8 ÷ 2 =
55 ÷ 11 =	24 ÷ 8 =	10 ÷ 10 =
18 ÷ 3 =	18 ÷ 6 =	88 ÷ 11 =

Numeracy
Minute Quiz 5-2 B

Name:
Date: Period:

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

84 ÷ 7 =	12 ÷ 4 =	7 ÷ 1 =
63 ÷ 9 =	54 ÷ 9 =	8 ÷ 2 =
55 ÷ 11 =	24 ÷ 8 =	10 ÷ 10 =
18 ÷ 3 =	18 ÷ 6 =	88 ÷ 11 =

Numeracy
Minute Quiz 5-2 C

Name:
Date: Period:

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

5 ÷ 1 =	30 ÷ 3 =	32 ÷ 8 =
10 ÷ 5 =	28 ÷ 7 =	110 ÷ 11 =
84 ÷ 7 =	21 ÷ 3 =	7 ÷ 1 =
44 ÷ 11 =	40 ÷ 4 =	12 ÷ 4 =

Numeracy
Minute Quiz 5-2 C

Name:
Date: Period:

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

5 ÷ 1 =	30 ÷ 3 =	32 ÷ 8 =
10 ÷ 5 =	28 ÷ 7 =	110 ÷ 11 =
84 ÷ 7 =	21 ÷ 3 =	7 ÷ 1 =
44 ÷ 11 =	40 ÷ 4 =	12 ÷ 4 =

Numeracy
Minute Quiz 5-2 C

Name:
Date: Period:

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

5 ÷ 1 =	30 ÷ 3 =	32 ÷ 8 =
10 ÷ 5 =	28 ÷ 7 =	110 ÷ 11 =
84 ÷ 7 =	21 ÷ 3 =	7 ÷ 1 =
44 ÷ 11 =	40 ÷ 4 =	12 ÷ 4 =

Numeracy
Warm-up 5-2

Name:
Date: Period:

Follow the instructions to find equivalent fractions.

1) $\frac{2}{15}$; multiply top & bottom by 3

2) $\frac{10}{40}$; divide top & bottom by 5

Fill in the blanks so that the following fractions are equivalent.

3) $\frac{2}{5} = \frac{[\quad]}{10}$

4) $\frac{6}{16} = \frac{[\quad]}{8}$

5) $\frac{2}{3} = \frac{[\quad]}{9}$

6) $\frac{7}{50} = \frac{[\quad]}{100}$

7) $\frac{3}{12} = \frac{[\quad]}{4}$

8) $\frac{9}{15} = \frac{[\quad]}{5}$

Numeracy
Warm-up 5-2

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Date: Period:

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8) $\frac{9}{15} = \frac{[\quad]}{5}$

Numeracy Name:
Notes #5-2 – Ratios and Proportions Date: Period:

A ratio is _____. There are _____ ways to write ratios.

Ex:

Ex:

A proportion is _____.

Ex: Ex:

When you _____, you _____.

Ex: Ex:

Ratios and proportions are very useful for _____!

Ex:

Ex:

Numeracy | Name: **Teacher's Edition**
Notes #5-2 – Ratios and Proportions | Date: Period:

A ratio is a comparison of two quantities. There are three ways to write ratios.

Ex: In 15 seconds, Mr. Wong's heart beats 20 times. Write this as a ratio.

15 sec to 20 beats 15 sec : 20 beats $\frac{15 \text{ sec}}{20 \text{ beats}}$

Ex: <student> eats six times every nine hours. Write this as a ratio.

6 eats to 9 hours 6 eats : 9 hours $\frac{6 \text{ eats}}{9 \text{ hours}}$

A **proportion** is an equality of two ratios.

Ex: $\frac{15 \text{ sec}}{20 \text{ beats}} = \frac{60 \text{ sec}}{80 \text{ beats}}$

Ex: $\frac{6 \text{ eats}}{9 \text{ hours}} = \frac{8 \text{ eats}}{12 \text{ hours}}$

When you **solve a proportion**, you find the missing piece.

Ex: $\frac{3}{6} = \frac{x}{14}$

$$14 \cdot \frac{3}{6} = x$$

$$7 = x$$

So,

$$\frac{3}{6} = \frac{7}{14}$$

Ex: $\frac{3}{4} = \frac{21}{b}$

$$b \cdot \frac{3}{4} = 21$$

$$b = 21 \cdot \frac{4}{3} = 7 \cdot 4 = 28$$

So,

$$\frac{3}{4} = \frac{21}{28}$$

Ratios and proportions are very useful for solving problems!

Ex: Mr. Wong bought 24 donuts for $14. How many donuts can he get for $21?

$$\frac{24 \text{ donuts}}{14 \text{ dollars}} = \frac{x \text{ donuts}}{21 \text{ dollars}} \implies \frac{24}{14} = \frac{x}{21} \implies 21 \cdot \frac{24}{14} = \frac{x}{21} \cdot 21 \implies \frac{504}{14} = x \implies 36 = x$$

So, he can get 36 donuts for $21.

Ex: <student> ate 6 donuts in 4 minutes. How many donuts can s/he eat in 10 minutes?

$$\frac{6 \text{ donuts}}{4 \text{ minutes}} = \frac{x \text{ donuts}}{10 \text{ minutes}} \implies \frac{6}{4} = \frac{x}{10} \implies 10 \cdot \frac{6}{4} = \frac{x}{10} \cdot 10 \implies \frac{60}{4} = x \implies 15 = x$$

So, <student> can eat 15 donuts in 10 minutes.

Numeracy Name:
Homework #5-2 – Ratios and Proportions Date: Period:

Solve each proportion.

1. $\frac{b}{21} = \frac{4}{3}$ **2.** $\frac{2}{9} = \frac{r}{36}$ **3.** $\frac{2}{v} = \frac{1}{8}$

Solve the following problems using proportions.

4. Mr. McIntyre ran three miles in 18 minutes. At that rate, how far can he run in 30 minutes?

5. Ms. Clem bought three posters for $9.60. How many posters can she buy for $48?

6. At Kinkos, Mr. Greene made 18 copies for $1.08. How much will 40 copies cost?

7. Mr. Wong inspected 750 computers and found that three of them were broken. At that rate, how many computers would be broken if he inspected 10,000 computers?

8. Ms. Victorio went on a vacation to Italy. While she was there, the exchange rate was 75 cents for every 1 euro (a “euro” is the money they use in Europe, like they use the “peso” in Mexico). How many euros can she get for $25?

Mr. Wong bought 2 posters for $4.00.
How many can he buy for $10.00?

$$10 \cdot \frac{2 \text{ posters}}{4 \text{ dollars}} = \frac{x}{10 \text{ dollars}} \cdot 10$$

$$10 \cdot \frac{2}{4} = x$$

$$\frac{20}{4} = x$$

$$5 = x$$

He can buy 5 posters.