Name: _____   Date: _____

PERCENT AND EQUIVALENT RATIOS
N-GEN MATH® 6

In the last lesson we concentrated on converting ratios into ones that were **based out of 100** to determine percentages. Let's review.

Exercise #1: A quiz in math class has 25 points on it. Answer the following.

(a) If Lynn scored 21 out of 25 points, what percent of the points did she earn? Show how you found your answer.

(b) On a long unit test that contained 200 points, Lynn scored 160 total points. Was that a higher or lower percent than what she earned on the quiz?

In today's lesson we will be **finding the percent** of a quantity. First, though, make sure you understand that percentages are just fractions of a whole.

Exercise #2: Change each of the following common percentages into fractions and then reduce.

(a) 10%   (b) 25%   (c) 50%   (d) 75%

So, when we are asked to find 50% of something, it really is the same as being asked to find half of it. Or when we are asked to find 20% of something, it is the same as finding one-fifth of it. When percentages aren't immediately obvious we can use equivalent ratios to help us.

Exercise #3: Of 20 people in a room, 35% of them wear glasses.

(a) Fill in the missing numerator to determine the number of people who wear glasses.

$$\frac{35}{100} = \frac{?}{20}$$

(b) In a different room of 25 people, 16% of the people are left-handed. How many people are left-handed?

Finding a **percent of a whole or total** can often be done by setting up a ratio and converting it so that it is equivalent to the percent ratio.

Exercise #4: Answer each of the following questions by setting up a percent ratio. You may need to reduce your percent ratio before finding the part of the total.

(a) **42% of 50** students on the bus brought a device to play games on. How many students brought a device?

(b) **12% of 300** people attending an event chose fish for dinner. How many people chose fish?

(c) Sean guesses **30% of 80**-coin tosses correctly (i.e. heads or tails). How many coin tosses does Sean guess correctly?

(d) **20% of 150** people who attend a play buy tickets at the door. How many of them buy tickets at the door?

We can use equivalent ratios to also find the **whole or total** if we know the **percent** and the **part**. Like in the previous problems, sometimes this requires some manipulation of the percent ratio.

Exercise #5: Set up percent ratios to help solve each of the following problems. Show your work.

(a) 12% of people are wearing sunglasses. If 60 people are wearing sunglasses, how many total people are there?

(b) Daniel earned 32 points on a test. If those 32 points were 80% of the total, how many total points were there?

(c) Ed found 3 eggs were cracked. If 15% of the eggs he looked at were cracked, how many total eggs did Ed look at?

(d) There are 39 8th graders on student council. If 65% of the student council is 8th graders, how many total students are on student council?

Name: _____ Date: _____

Turn this page in

FLUENCY   **Starting with problem #2, you MUST show work to receive full credit.**

1. Finding 25% of a total is the same as finding what fraction of it?

   (1) $\dfrac{1}{25}$ (3) $\dfrac{1}{3}$

   (2) $\dfrac{1}{4}$ (4) $\dfrac{1}{2}$ _____

2. What is 50% of 140?

   (1) 20   (3) 70

   (2) 50   (4) 150

USING YOUR MATH   _____

3. For each of the following, set up a percent ratio to help **find the part** given the percent and the whole (or total). You will **not** need to reduce your percent ratio first.

   (a) On a 50-point quiz, Jenna earned 82% of the points. How many points did she earn?

   (b) 64% of 25 students in a class have a phone. How many students have a phone?

   (c) In a school with 400 students, 22% of them are in 6th grade. How many students are in 6th grade?

   (d) In a group of 700 people, only 5% of them have red hair. How many of the 700 people have red hair?

4. For each of the following, set up a percent ratio to **find the part** given the percent and the whole. You will need to reduce the ratio first to solve the problem.

(a) 40% of 70 ice cream orders were for vanilla. How many orders were for vanilla?

(b) 15% of 60 people flying on an airplane have their own headphones. How many people have their own headphones?

5. For each of the following, set up a percent ratio to **find the whole**, given the percent and the part. You will not need to reduce the ratio first to solve the problem.

(a) 22% of a group of people voted in the last election. If 66 of the people voted, how many total people were there?

(b) 12 students in a class brought their lunch to school, which was 48% of the students. How many students are in the class?

6. For each of the following, set up a percent ratio to **find the whole**, given the percent and the part. You will need to reduce the ratio first to solve the problem.

(a) 35% of flowers sold on a day were roses. If 42 roses were sold, how many total flowers were sold?

(b) James got 80% of the total points on a quiz correct. If he got 36 points, what was the total points on the quiz?

REVIEWING YOUR MATH

7. Solve each of the following equations. Show how you solved them.

(a) $\dfrac{x}{8} = 3$

(b) $\dfrac{n}{20} = \dfrac{1}{2}$

(c) $\dfrac{c}{40} = \dfrac{3}{8}$