

**Common Core Standard****Friday, December 4, 2015 'B' Week**

Students understand that the whole is 100% and use the formula  $Part = Percent \times Whole$  to problem-solve when given two terms out of three from the part, whole, and percent.

Students solve word problems involving percent using expressions, equations, and numeric and visual models.

**Lesson 2: Part of a Whole as a Percent****Opening Exercise**

- a. What is the whole unit in each scenario?

Scenario	Whole Unit
15 is what percent of 90?	
What number is 10% of 56?	
90% of a number is 180.	
A bag of candy contains 300 pieces and 25% of the pieces in the bag are red.	
Seventy percent (70%) of the students earned a B on the test.	
The 20 girls in the class represented 55% of the students in the class.	

b. Read each problem and complete the table to record what you know.

Problem	Part	Percent	Whole
40% of the students on the field trip love the museum. If there are 20 students on the field trip, how many love the museum?			
40% of the students on the field trip love the museum. If 20 students love the museum, how many are on the field trip?			
20 students on the field trip love the museum. If there are 40 students on the field trip, what percent love the museum?			

### Example 1: Visual Approaches to Finding a Part, Given a Percent of the Whole

In Ty's math class, 20% of students earned an A on a test. If there were 30 students in the class, how many got an A?

<b>Students</b>	
<b>Percent</b>	

What is the part? \_\_\_\_\_

What is the percent? \_\_\_\_\_

What is the whole? \_\_\_\_\_

## Exercise 1

In Ty's art class, 20% of the Flag Day art projects received a perfect score. There were 25 art projects turned in by Ty's class. How many of the art projects earned a perfect score? (Identify the whole.)

<b>Art Projects</b>		
<b>Percent</b>		

What is the part? \_\_\_\_\_

What is the percent? \_\_\_\_\_

What is the whole? \_\_\_\_\_

## Interpreting your answers:

There were \_\_\_\_\_ art projects turned in by Ty's Class.

\_\_\_\_\_ % of the \_\_\_\_\_ art projects received a perfect score.

Out of the \_\_\_\_\_ projects turned in, \_\_\_\_\_ students received a perfect score.

## Example 2: A Numeric Approach to Finding a Part, Given a Percent of the Whole

In Ty's English class, 70% of the students completed an essay by the due date. There are 30 students in Ty's English class. How many completed the essay by the due date?

<b>Students</b>			
<b>Percent</b>			

What is the part? \_\_\_\_\_

What is the percent? \_\_\_\_\_

What is the whole? \_\_\_\_\_

**\*\*REMEMBER TO USE SIMPLE PERCENTS ( 5% - 10% - 20% - 25% - 50% to simplify )\*\***

### Interpreting your answers:

There were \_\_\_\_\_ students in Ty's English class.

\_\_\_\_\_ % of the \_\_\_\_\_ students completed the essay by the due date.

Out of the \_\_\_\_\_ students who needed to turn in an essay, only \_\_\_\_\_ students turned in their essay by the due date.



## Exercise 2

A bag of candy contains 300 pieces of which 28% are red. How many pieces are *NOT* red?

- a. Write an equation to represent the number of pieces that are not red,  $n$ .

<b>Equation:</b> $Part = Percent \times Whole$	<b>Let</b> $y =$ _____				
_____	=	_____	<b>x</b>	_____	<b>Simplify.</b>
(Part)		(Percent that is NOT Red)		(Whole)	
_____	=	_____	<b>x</b>	_____	
(Part)		(Percent that is NOT Red)		(Whole)	

- b. Use your equation to find the number of pieces of candy that are not red.

<b>Equation:</b> $Part = Percent \times Whole$	<b>Let</b> $y =$ _____				
_____	=	_____	<b>x</b>	_____	<b>Now solve it.</b>
(Part)		(Change Percent to Decimal )		(Whole)	

Solution: \_\_\_\_\_

### Interpreting the solutions from Exercises 1 & 2:

There were \_\_\_\_\_ pieces of candy in total. We have now determined that 28% ( \_\_\_\_\_ pieces) were red, and the other 72% ( \_\_\_\_\_ pieces) were NOT red.

### Example 4: Comparing Part of a Whole to the Whole with the Percent Formula

Zoey inflated 24 balloons for decorations at the middle school dance. If Zoey inflated 15% of the balloons that are inflated for the dance, how many balloons are there in total? Solve the problem using the percent formula, and verify your answer using a visual model.

**Equation:** *Part = Percent x Whole*

$$\frac{\text{Part}}{\text{Percent}} = \text{Whole}$$

$$\frac{\text{Part}}{\text{Percent as a decimal}} = \text{Whole}$$

What is the part? \_\_\_\_\_

What is the percent? \_\_\_\_\_

What is the whole? \_\_\_\_\_

What is the GCF of 15%?

**\*\*REMEMBER TO USE SIMPLE PERCENTS ( 5% - 10% - 20% - 25% - 50% to simplify )\*\***

*Interpreting the solution:*

Zoey had inflated \_\_\_\_\_ balloons,

which was only \_\_\_\_\_% of the balloons

in total. If Zoey inflates all of the

balloons needed for the school dance,

she will inflate \_\_\_\_\_ balloons in total.

<b>Balloons</b>			
<b>Percent</b>			

### Example 5: Finding the Whole given a Part of the Whole and the Corresponding Percent

Haley is making admission tickets to the middle school dance. So far she has made 112 tickets, and her plan is to make 320 tickets. What percent of the admission tickets has Haley produced so far? Solve the problem using the percent formula, and verify your answer using a visual model.

**Equation:**  $Part = Percent \times Whole$

$$\frac{\text{(Part)}}{\text{(Part)}} = \frac{\text{(Percent)}}{\text{(Percent as a decimal)}} \times \frac{\text{(Whole)}}{\text{(Whole)}}$$

What is the part? \_\_\_\_\_

What is the percent? \_\_\_\_\_

What is the whole? \_\_\_\_\_

$$\frac{\text{Part}}{\text{Whole}} = \boxed{\phantom{00}} \%$$

Interpreting the solution:

If Haley has made \_\_\_\_\_ tickets so far, she has only completed \_\_\_\_\_% of the total \_\_\_\_\_ tickets that need to be created.

**Directions:** Complete the double number line model below.

