Name: **Date:**

Unit 11, Day 5 Notes **Period:**

Learning Targets

- I can calculate and interpret z-scores and standard deviations in a real world context

Vocabulary (or properties or formulas)

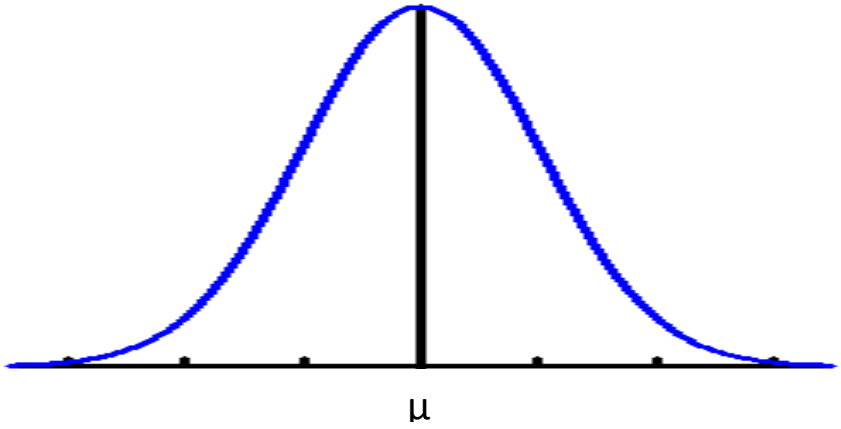
Standard Deviation	Mean	Data Element	Z-Score	Normal Curve

Introduction

Here are the ages of the dogs (in years) available for adoption at the Fairfax County Shelter last week:

7 4.5 3 2.6 .75 2.1 3.2 9 6 5.5 1.25

Again label the number line of the graph below with the approximate mean (4) and ±3 standard deviations to the right and to the left of the mean. The standard deviation is 2.



1. How many standard deviations away from the mean is the dog that is 7 years old? z = _____

You can usually figure #1 out intuitively. Let's slow down the thinking process. Think about what you are actually doing as you try to do the next question.

2. How many standard deviations away from the mean is a dog that is 7.4 years old? z = _____

Use the formula to answer question 2: **z** =

Where can I find this formula, in the event that I forget?

Now find the z-scores for the next four dogs:

4.5	**z** =
3	**z** =
2.6	**z** =
.75	**z** =

Why find a z-score? How does it help us to compare data?

Consider this problem:

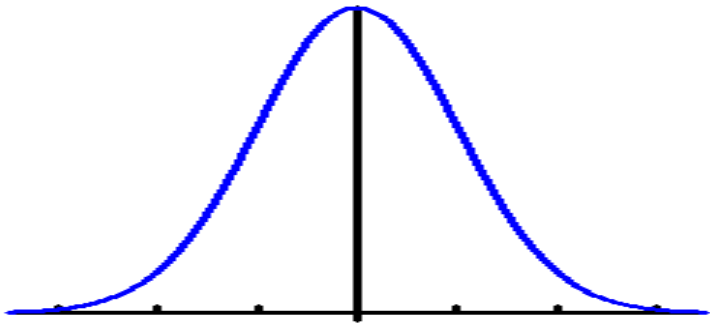
In 2009, Amy scored a 31 on the mathematics portion of her ACT. The mean score was a 21 and the standard deviation was 5

Stephanie scored a 720 on the mathematics portion of her 2009 SAT. The mean score that year was 515 and the standard deviation was 95.

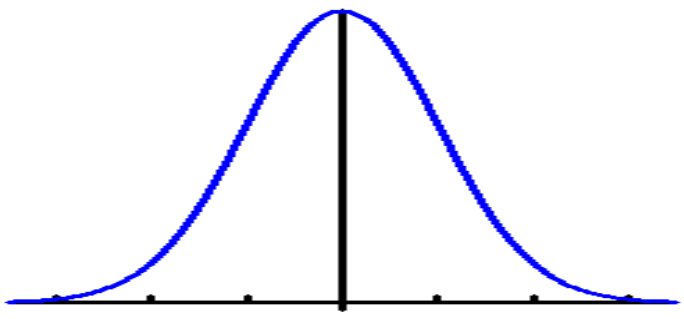
Whose achievement was higher on the mathematics portion? Z scores can help us find out!

Use the information above to create a normal curve for both the SAT and ACT?

Amy – ACT



Stephanie – SAT



Now that we understand how a z-score is used, let's look at some examples from the SOL.

On the Released 2014 SOL it looks like…

Example 1. Statistical information for a data set is given. • The mean is 18.1 • The z-score for 13.0 is -1.7 What is the standard deviation for this data set? A. 1.7 B. 3.0 C. 3.4 D. 5.1	Example 2. The data set shown has a mean of 37 and a standard deviation of 6.3, rounded to the nearest tenth. $\{26, 29, 32, 33, 35, 36, 37, 39, 40, 44, 45, 48\}$ How many of these data points have a z-score greater than -0.6? A. 3 B. 5 C. 8 D. 9	Example 3. A data set has a mean of 68.42 and a standard deviation of 7.91. An element in this set is 57. What is the z-score for 57? Round the answer to the nearest hundredth. z-score =