

Pratik Gandhi, Steven MacDonald
 GK-12: AP Statistics at Lawrence High School

Summary:

Since students were learning about mean, variance, standard deviation and z-score, Mr. MacDonald and I thought it would be better to talk about normal distribution. So I made a MATLAB model, in which they can plot multiple Gaussian curves as they change mean and standard deviation. I also had some exercise, where they had to put some z-score value and MATLAB draws a line to that corresponding point. I explained them how to z-score is derived and how it is used. It was a fun exercise, since they understood the concept of mean, std, variance, and z-score. I also explained them the importance of Gaussian curve in my research.

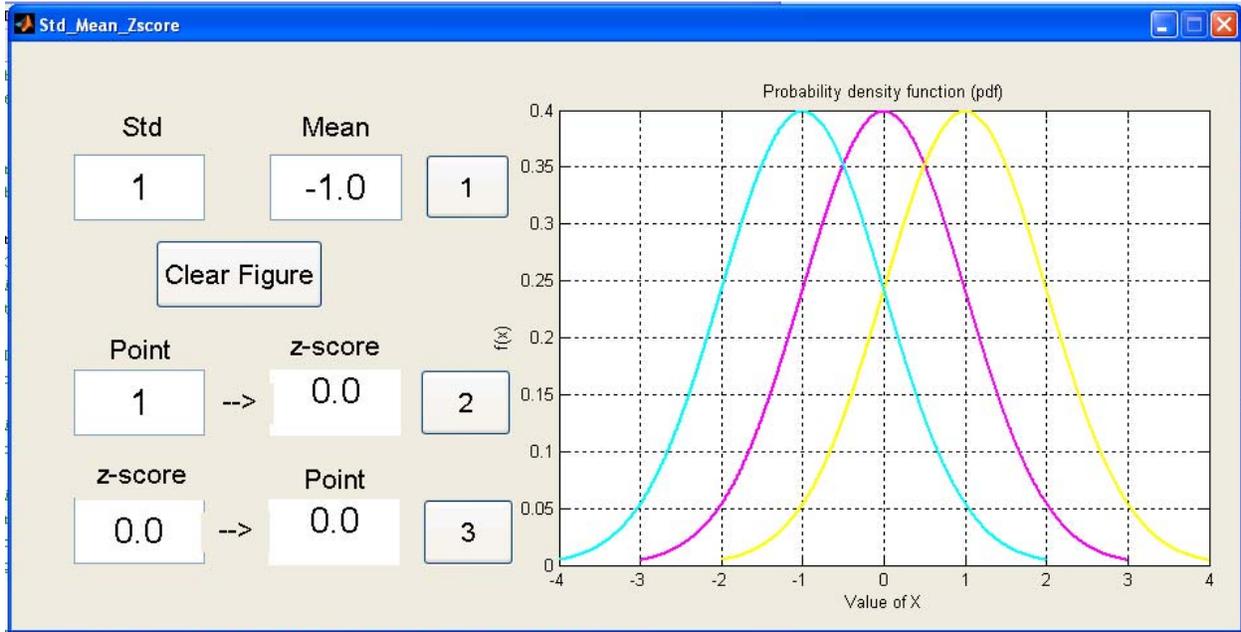
Period: **Class: Normal Distribution**

Date(s): October 4, 2011

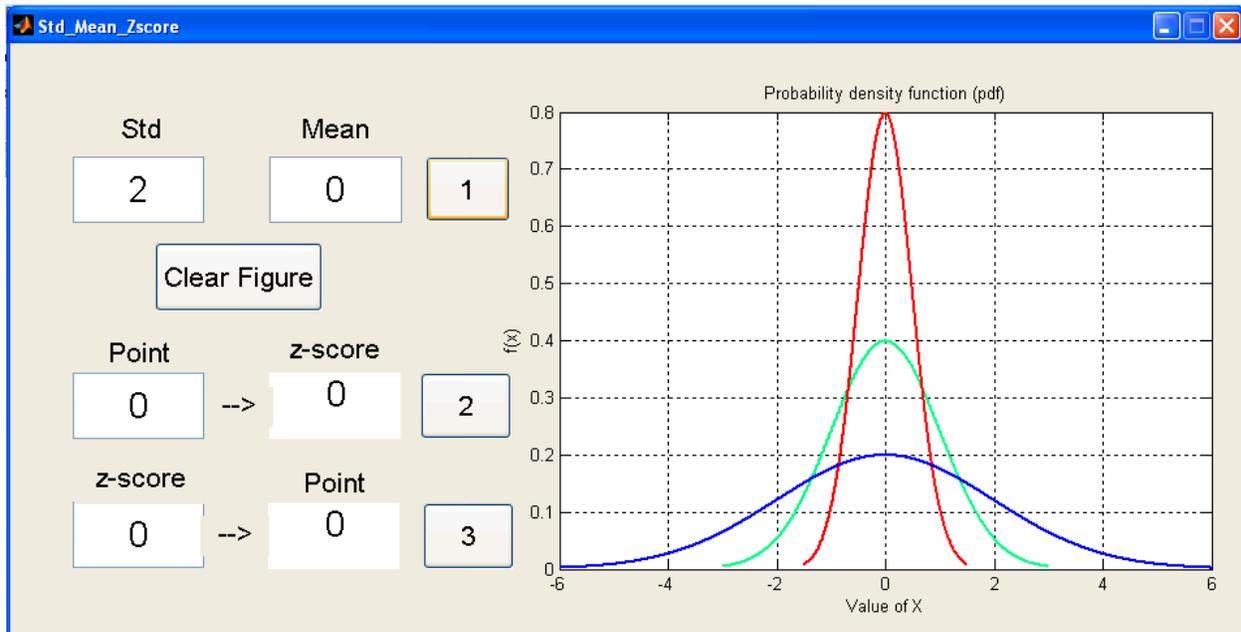
SETTING THE STAGE	
<u>Essential Question</u>	What makes millions of people around the world to talk to each other on cell phones
<u>Content Objective(s)</u> (Student-friendly)	We should be able to understand Normal Distribution.
<u>Connection to previous or future lessons</u>	Can lead to correlation and linear regression
<u>Critical Thinking Questions</u>	What is normal distribution? How does it play a role in wireless communication?
<u>Key Vocabulary</u>	Mean, variance, z-score
<u>Materials Needed/Safety</u>	Computers, MATLAB
ACTIVE	

INSTRUCTION	
<ul style="list-style-type: none"> • Launch (Engage) 	<p>Discuss about generating normal distribution. Teach them about the histogram, how generate one using MATLAB. Define mean and variance, and how they are used.</p> <p>Launch the MATLAB GUI program, Std_Mean_Zscore.m, and using it as demo to let them know how mean and variance affect the distribution. How the z-score is related to normal distribution. Explain them about Gaussian distribution and how the noise is considered as part of it.</p> <p>Generate a bunch of normal distributed numbers and use the sound command to generate noise.</p>
<ul style="list-style-type: none"> • Investigation (Explore) 	<p>How is the distribution affected by changing the mean and the variance? What does the z-score tell you? How to look up the table for the z-score?</p>
<p>TIME FOR REFLECTION</p>	
<ul style="list-style-type: none"> • Summarization (Explain & Extend) 	<p>Summarize them all the definition related to the normal distribution such as mean, variance, and z-score. Also discuss the importance of using software such as MATLAB to do simulation in short time.</p>
<ul style="list-style-type: none"> • Assessment (Evaluate) 	<p>Ask them to write or discuss about what they learned about normal distribution.</p>
<ul style="list-style-type: none"> • Homework 	<p>Find out where it is used.</p>

(1) Change in mean



(2) Change in standard deviation (std)



(3) Understanding z-score

