Anoka-Hennepin Secondary Curriculum Unit Plan

Department:	Mathematics	Course:	Statistics and Probability	Unit 7 Title:	The Normal Distribution	Grade Level(s):	10-11
Assessed Trimester:	Trimester A	Pacing:	5-6 Days	Date Created:	1/29/2014	Last Revision Date:	1/29/2014

Course Understandings: *Student will understand that:*

D. Graphs and data displays allow them to see trends, center, and spread of large amounts of data as well as compare multiple sets of data to make real-world conclusions.
H. Technology can be used to assist with calculations, simulations, and data analysis.

DESIRED RESULTS (Stage 1) - WHAT WE WANT STUDENT TO KNOW AND BE ABLE TO DO?

Established Goals

Minnesota State/Local/Technology Standard(s) addressed (2007):

- **Standard (9.4.1.#):** Display and analyze data; use various measures associated with data to draw conclusions, identify trends and describe relationships.
  Benchmark:
  9.4.1.4 Use the mean and standard deviation of a data set to fit it to a normal distribution (bell-shaped curve) and to estimate population percentages. Recognize that there are data sets for which such a procedure is not appropriate. Use calculators, spreadsheets and tables to estimate areas under the normal curve.

Transfer

Students will be able to independently use their learning to: (product, high order reasoning)

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Meaning

Unit Understanding(s):

Students will understand that:

- Given a distribution is normal, the mean and standard deviation can be used to determine the distribution (using the 68-95-99.7 Rule).
- Given the mean and standard deviation of a normal distribution, any area under the curve, percentile, or probability can be calculated for that distribution.
- In order to compare two situations that do not have the same mean and standard deviation you need to use z-scores/standard scores to make a comparison.
- Given the mean, standard deviation, and percentile of interest of a normal distribution, it is possible to determine the actual value of interest.

Essential Question(s):

Students will keep considering:

- How do you compare athletes of different generations or different genders?
- How do college admissions determine what minimal score a student has to get to be accepted into their school?

Acquisition

Knowledge - Students will:

- Recognize when using normal distributions are appropriate for sets of data
- Understand normal distributions, including mean, standard deviation, shape, percentiles, and standardized scores

Reasoning - Students will:

- Classify data as normally distributed or not

Skills - Students will:

- Use mean and standard deviation to fit data to a normal distribution and estimate population percentages.
- Use calculators, spreadsheets and tables to estimate areas under the normal curve.
- Calculate z-scores, percentiles, p-values (above, below and between).

Common Misunderstandings	**Essential new vocabulary**
● Students have difficulty changing a percentile to a raw score. ● Students struggle with the meaning of a normal distribution. ● Students struggle with the measurements of raw data, z-score, percentile. ● Students have difficulty finding the area under a normal curve “between” two scores. ● Students have trouble using the 68-95-99.7 rule to find varying areas (above, below, between) if their geometry/spatial skills are weak.	● 68-95-99.7 rule (Empirical rule) ● Density curve ● Normal distribution ● Percentiles ● z-score/standard score