Math III
Unit 6
Data Analysis and Probability

Mathematics III – Unit 6
Data Analysis and Probability

INTRODUCTION:

Students have spent the entire year of Mathematics III learning different functions and how they are used. In the final unit of the year, students will look again at probability. Students will use a normal distribution to calculate probabilities. They will organize, represent, investigate, interpret, and make inferences using data from both observational studies and experiments.

ENDURING UNDERSTANDINGS:

- Understand the difference between discrete random variables and continuous random variables
- Use normal distribution to interpret problems involving probabilities
- Understand the difference between experimental and observational studies

KEY STANDARDS ADDRESSED:

MM3D1. Students will create probability histograms of discrete random variables, using both experimental and theoretical probabilities.

MM3D2. Students will solve problems involving probabilities by interpreting a normal distribution as a probability histogram for a continuous random variable (*z*-scores are used for a general normal distribution).

a. Determine intervals about the mean that include a given percent of data (Empirical Rule).
b. Determine the probability that a given value falls within a specified interval.
c. Estimate how many items in a population fall within a specified interval.

MM3D3. Students will understand the differences between experimental and observational studies by posing questions and collecting, analyzing, and interpreting data.

RELATED STANDARDS ADDRESSED:

MM1P1. Students will solve problems (using appropriate technology).

a. Build new mathematical knowledge through problem solving.
b. Solve problems that arise in mathematics and in other contexts.
c. Apply and adapt a variety of appropriate strategies to solve problems.
d. Monitor and reflect on the process of mathematical problem solving.

MM1P2. Students will reason and evaluate mathematical arguments.

a. Recognize reasoning and proof as fundamental aspects of mathematics.
b. Make and investigate mathematical conjectures.
c. Develop and evaluate mathematical arguments and proofs.
d. Select and use various types of reasoning and methods of proof.

MM1P3. Students will communicate mathematically.

a. Organize and consolidate their mathematical thinking through communication.
b. Communicate their mathematical thinking coherently and clearly to peers, teachers, and others.
c. Analyze and evaluate the mathematical thinking and strategies of others.
d. Use the language of mathematics to express mathematical ideas precisely.

MM1P4. Students will make connections among mathematical ideas and to other disciplines.

a. Recognize and use connections among mathematical ideas.
b. Understand how mathematical ideas interconnect and build on one another to produce a coherent whole.
c. Recognize and apply mathematics in contexts outside of mathematics.

MM1P5. Students will represent mathematics in multiple ways.

a. Create and use representations to organize, record, and communicate mathematical ideas.
b. Select, apply, and translate among mathematical representations to solve problems.
c. Use representations to model and interpret physical, social, and mathematical phenomena.

Math 3 Unit 6 Content Map
Data Analysis and Probability

Unit 6 – Data Analysis and Probability

Unit Essential Question:
How do you use a normal distribution to calculate probabilities? How do you organize, represent, investigate, interpret, and make inferences using data from both observational studies and experiments?

Lesson 1: Probability Histograms

How do you create and interpret a probability histogram?

Lesson 2: Normal Distributions

What are the standard intervals for a normal distribution?
How are these intervals used to solve problems?

Lesson 3: Experimental vs. Observational Studies

What is the difference between an experiment and observational study?