Unit 5: Modelling Continuous Data

MDM4U

Lesson Outline

Big Picture

Students will:

- describe the shapes of distributions of continuous data;
- extend the concept of a discrete probability distribution to a continuous probability distribution;
- understand the features of the normal distribution;
- apply normal distributions to real-world situations recognizing the role of variability.

Day	Lesson Title	Math Learning Goals	Expectations
1–2	Look at Continuous Data *(lessons not included)*	• Identify a continuous random variable. • Distinguish between situations that result in discreet vs. continuous frequency distribution. • Recognize standard deviation as a measure of the spread of a distribution. • Determine the mean and standard deviation of a sample of values, with and without technology. • Recognize the need for mathematical models to represent continuous frequency distributions. • Use intervals to represent a sample of values of continuous random variables numerically (frequency table) and graphically (frequency histogram and polygon). • Use technology to compare the effectiveness of the frequency polygon as an approximation of the frequency distribution. • Recognize that the probability of a continuous random variable taking any *specific* value is zero.	B2.1, B2.2, B2.3, B2.4, B2.5
3–5	Normal Distributions *(lessons not included)*	• Recognize important features of a normally distributed data, e.g., bell-shaped, the percentages of data values within one, two, and three standard deviations of the mean. • Recognize and describe situations that might be normally distributed. • Investigate the conditions under which the shape of a binomial distribution approaches a normal distribution, i.e., as the number of trials increases and/or the probability of "success" gets closer to one-half. • Investigate the conditions under which the shape of a hypergeometric distribution approaches a normal distribution, i.e., as the number of dependent trials increases and/or the probability of "success" gets closer to one-half. • Use a discrete probability distribution to approximate the probability that a normal random variable takes on a specific range of values. • Recognize that a continuous probability distribution is used to calculate the probability that a random variable takes on a range of values.	B2.5, B2.6, B2.7

Day	Lesson Title	Math Learning Goals	Expectations
6–7	Probabilities In A Normal Distribution *(lessons not included)*	• Define and calculate *z*-scores.	B2.8 D1.2
8–9	Solving Problems Using The Normal Distribution *(lessons not included)*	• Use the normal distribution to model one-variable data sets after determining that such a model might be suitable. • Interpret, for a normally distributed population, the meaning of a statistic qualified by a statement describing the margin of error. Recognize that this is one way to account for variability. • Solve probability problems involving normal distribution using a variety of tools and strategies. • Apply normal distributions to real-world situations.	B2.8 D1.4
10–11	Summative, Jazz		