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Outcome Chart - Ontario - Mathematics of Data Management 12 MDM4U

Counting and Probability

Overall Expectations

Students will:

- solve problems involving the probability of an event or a combination of events for discrete sample spaces;

Specific Expectations

Students will:

- recognize and describe how probabilities are used to represent the likelihood of a result of an experiment (e.g., spinning spinners; drawing blocks from a bag that contains different-coloured blocks; playing a game with number cubes; playing Aboriginal stick-and-stone games) and the likelihood of a real-world event (e.g., that it will rain tomorrow, that an accident will occur, that a product will be defective)

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Probability Distributions

Overall Expectations

Students will:

- demonstrate an understanding of discrete probability distributions, represent them numerically, graphically, and algebraically, determine expected values, and solve related problems from a variety of applications;

Specific Expectations

Students will:

- recognize and identify a discrete random variable X (i.e., a variable that assumes a unique value for each outcome of a discrete sample space, such as the value x for the outcome of getting x heads in 10 tosses of a coin), generate a probability distribution [i.e., a function that maps each value x of a random variable X to a corresponding probability, $P(X=x)$] by calculating the probabilities associated with all values of a random variable, with and without technology, and represent a probability distribution numerically using a table

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Statistical Analysis

Overall Expectations

Students will:

- demonstrate an understanding of the applications of data management used by the media and the advertising industry and in various occupations.

Specific Expectations

Students will:

- interpret statistics presented in the media (e.g., the UN's finding that 2% of the world's population has more than half the world's wealth, whereas half the world's population has only 1% of the world's wealth), and explain how the media, the advertising industry, and others (e.g., marketers, pollsters) use and misuse statistics (e.g., as represented in graphs) to promote a certain point of view (e.g., by making a general statement based on a weak correlation or an assumed cause-and-effect relationship; by starting the vertical scale at a value other than zero; by making statements using general population statistics without reference to data specific to minority groups)
- assess the validity of conclusions presented in the media by examining sources of data, including Internet sources (i.e., to determine whether they are authoritative, reliable, unbiased, and current), methods of data collection, and possible sources of bias (e.g., sampling bias, non-response bias, cultural bias in a survey question), and by questioning the analysis of the data (e.g., whether there is any indication of the sample size in the analysis) and conclusions drawn from the data (e.g., whether any assumptions are made about cause and effect)

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