PROBABILITY 2

Enduring Understanding: Improve understanding of the concepts of theoretical probability, dependent and independent events and geometric probability. Improve understanding of how to determine and use probabilities. Improve understanding of the concepts of dependent and independent events. Improve understanding of how to determine and use probabilities of dependent and independent events. Improve understanding of how to identify, determine the size of, or list the sample space and determine the probability of compound, dependent, and independent events. Improve understanding of how to select and use appropriate concepts and procedures from number sense, measurement, geometric sense, probability and statistics, and/or algebraic sense.

Essential Questions:

- What is experimental probability vs. theoretical probability?
- What is a sample space?
- How can a tree diagram be used to find the probability?
- What is meant by replacement and without replacement?
- What is meant by a multi-stage event?
- What is meant by independent events?
- What is meant by dependent events?
- What are mutually exclusive events?
- How are probabilities expressed?
- What is meant by event 1 **and** event 2 occurring vs. event 1 **or** event 2 occurring?
- How are probabilities expressed?
- How is geometric probability different than theoretical probability?
- How is a position defended or refuted by using mathematical data?
- How is the area of a region determined?

Lesson Overview:

- Before allowing the students the opportunity to start the activity: access their prior knowledge with regard to determining geometric probability. Discuss with students the types of games that they have played such as darts, hop-scotch, skeet ball, etc. Discuss games where geometric probability occur. How many students have gone bowling? How easy it is the knock down a single pin? How many have played or seen the games on television?
- Remind students that the probability of an event is a ratio between 0 and 1 inclusive.
- $P(A \text{ and } B) = P(A) \cdot P(B)$
- Experimental probability = $\frac{\text{Number of successes}}{\text{Number of tries}}$
- Theoretical probability is $P(E) = \frac{\text{Number of desired (favorable) outcomes in the event}}{\text{Total number of (possible) outcomes in the sample space}}$
- Expand the questions in each activity as much as possible.
- Allow students the use of a protractor to draw the spinner accurately on question #2 in Activity 1.
- Before allowing the students the opportunity to start the activity: access their prior knowledge with regards to their experiences with probability.
- A good warm-up would be Ghost.
- Have the students work in groups of 2 to roll two number cubes 50 times. Have them chart the combinations that occur. Then combine the data from all of the groups into one chart on the board