Marietta City Schools

District Unit Planner

Everything on the unit planner must be included on the unit curriculum approval statement.

Accelerated Grade 7/8 Mathematics

Unit title	*Unit 3: Probability* *(GaDOE Grade 7 Unit 6)*	**MYP year**	*2*	**Unit duration (hrs)**	*15 Hours*

Mastering Content and Skills through INQUIRY (Establishing the purpose of the Unit): *What will students learn?*

GSE Standards

Standards

Investigate chance processes and develop, use, and evaluate probability models.

MGSE7.SP.5 Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around 1/2 indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event.

MGSE7.SP.6 Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency. Predict the approximate relative frequency given the probability. *For example, when rolling a number cube 600 times, predict that a 3 or 6 would be rolled roughly 200 times, but probably not exactly 200 times.*

MGSE7.SP.7 Develop a probability model and use it to find probabilities of events. Compare experimental and theoretical probabilities of events. If the probabilities are not close, explain possible sources of the discrepancy.

MGSE7.SP.7a Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events

MGSE7.SP.7b Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process. *For example, find the approximate probability that a spinning penny will land heads up or that a tossed paper cup will land open-end down. Do the outcomes for the spinning penny appear to be equally likely based on the observed frequencies?*

MGSE7.SP.8 Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation.

MGSE7.SP.8a Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs.

MGSE7.SP.8b Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams. For an event described in everyday language (e.g., "rolling double sixes"), identify the outcomes in the sample space which compose the event.

MGSE7.SP.8c Explain ways to set up a simulation and use the simulation to generate frequencies for compound events. For example, if 40% of donors have type A blood, create a simulation to predict the probability that it will take at least 4 donors to find one with type A blood.

Concepts/Skills to be Mastered by Students

- Probabilities are fractions derived from modeling real world experiments and simulations of chance.
- Modeling real world experiments through trials and simulations are used to predict the probability of a given event.
- Chance has no memory. For repeated trials of a simple experiment, the outcome of prior trials has no impact on the next.
- The probability of a given event can be represented as a fraction between 0 and 1.
- Probabilities are similar to percents. They are all between 0 and 1, where a probability of 0 means an outcome has 0% chance of happening and a probability of 1 means that the outcome will happen 100% of the time. A probability of 50% means an even chance of the outcome occurring.
- The sum of the probabilities of every outcome in a sample space should always equal 1.
- The experimental probability or relative frequency of outcomes of an event can be used to estimate the exact probability of an event.
- Experimental probability approaches theoretical probability when the number of trials is large.
- Sometimes the outcome of one event does not affect the outcome of another event. (This is when the outcomes are called independent.)
- Tree diagrams and arrays are useful for describing relatively small sample spaces and computing probabilities, as well as for visualizing why the number of outcomes can be extremely large.
- Simulations can be used to collect data and estimate probabilities for real situations that are sufficiently complex that the theoretical probabilities are not obvious.

Key concept	Related concept(s)	Global context
Logic	Justification, Model, Generalization	Fairness and Development

Statement of inquiry

Decisions reached through logic may not always reflect beliefs about fairness.

Inquiry questions

Factual— What is probability? What is a sample space?

Conceptual—How do we calculate probability of an event? What are the different ways to show possible outcomes? Why must the sample space always have a sum of 1?

Debatable—Should experimental and theoretical have the same outcome?

MYP Objectives	Assessment Tasks

*What specific MYP **objectives** will be addressed during this unit?*	***Relationship** between summative assessment task(s) and statement of inquiry:*	*List of common formative and summative assessments.*
Criterion B: Investigating Patterns		**Formative Assessment(s):** Unit 6 CFA **Summative Assessment(s):** Unit 6: Probability MYP:Topic 7 Performance Assessment Form B
Approaches to learning (ATL)		
Give and receive meaningful feedback. Keep an organized and logical system of information files/notebooks. **Category:** **Cluster:** **Skill Indicator:**		

Learning Experiences Add additional rows below as needed.		
Objective or Content	**Learning Experiences**	**Personalized Learning and Differentiation**
MGSE7.SP.7 Develop a probability model and use it to find probabilities of events. Compare experimental and theoretical probabilities of	**What Are My Chances?** Students will run various experiments and explore probabilities in this activity. Students will explore the meaning of theoretical probability and compare it	To extend the thinking of students on this task, the teacher may ask students to make a prediction table as to what they

events. If the probabilities are not close, explain possible sources of the discrepancy. **MGSE7.SP.8a** Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs.	with experimental probability using simple and compound probability.	think the results will be through 30 trials of a coin toss. In addition, students can explore the term equally likely events. Struggling students may struggle to make the explicit connection between theoretical and experimental probability. Providing more contextual examples will help students make connections between mathematics and their world.
MGSE7.SP.7 Develop a probability model and use it to find probabilities of events. Compare experimental and theoretical probabilities of events. If the probabilities are not close, explain possible sources of the discrepancy.	**Sickle Cell Anemia Inheritance.** Students will explore experimental and theoretical probability through the context of genes. Students will use the occurrence of Sickle Cell Anemia to create a probability model and compare results from the experimental and theoretical probability of a child inheriting the Sickle Cell Trait of Sickle Cell Anemia.	For students needing an extension, have them consider what the different parent combinations would yield in terms of probabilities of genotypes then allow them to think about that. Have them construct Punnet squares with the different combinations of parent genotypes and form hypotheses/predictions about those combinations.
Content Resources		
Savvas NCTM Illuminations		