

Unit Title: Probability

Grade Level: (*example: 9, 10, 11, 12 or 7-8*) 11

Subject Area: (*example: Science, Physics; English, Short Stories*) Algebra 2

Duration/Length/Number of class periods: (*example: 5 class periods*) 3 days (*block scheduling*)

Description: Understand the concepts of experimental probability and apply them in real world situations.

Established Goals (National, State, Local): Minnesota State Standards, 2007

Calculate probabilities and apply probability concepts to solve real-world and mathematical problems.

9.4.3.2 Calculate experimental probabilities by performing simulations or experiments involving a probability model and using relative frequencies of outcomes.

9.4.3.3 Understand that the Law of Large Numbers expresses a relationship between the probabilities in a probability model and the experimental probabilities found by performing simulations or experiments involving the model.

What Enduring Understandings are desired?

Experimental Probability directs individuals and companies in making critical decisions.

What Essential Questions will be considered?

What is the difference between theoretical and experimental probability?

How can data be used to make predictions?

Students will know/be able to:

I can identify if a problem is using theoretical or experimental probability.

I can determine the probability of outcomes based on a simulation or experiment.

I can collect and use data to predict future outcomes.

Description <i>Units must include at least one of each formative, summative, introductory activity and learning activity. Check the appropriate box; one per row.</i>	Formative	Summative	Introductory Activity	Learning Activity	Student Technology Used	Teacher Technology Used	ISTE Standards
Day 1 - Sum of Dice: Theoretical Probability - what we expect to happen Experimental - roll dice 30 times, create graph online, submit on Schoology - Submit individual results on Google docs to create a class set of data - Compile all classes' data to create on large graph Compare the graphs - recognize that the larger the data set, the closer the results are to the predicted (Theoretical) https://drive.google.com/drive/u/0/my-drive			X	X	X	X	
Discuss the use of probability in business decisions. (examples from Optum) Practice with Experimental and Theoretical using random application problems Quizizz Review of Experimental and Theoretical Probability https://tinyurl.com/yxv92e3u	X				X	X	1 5
Is It Fair? Activity from Illuminations, NCTM 1) Model the Experiment with red/red and red/blue chips 2) Students write a response to question 1 (Is it fair? Why/why not) - Discuss with partner, come up with an opinion - Submit flipgrid with their answer and explanation - Submit yes/no answer on Google forms - Discuss results as a class, listen to some flipgrids and look at results on Forms 3) Conduct experiment with partner (#2) - Submit answer (yes/no) on Google forms 4) Students create tree diagrams to determine theoretical probability - Submit answer (yes/no) on Google forms 5) Class discussion on experimental vs theoretical results, why their prediction was wrong.... Extension: Complete page 2 and 3 (skip the experiment if necessary)	X			X	X	X	1, 6 3,4,6, 7

Submit Responses https://docs.google.com/forms/d/1BX1z388grf18F_Rvft9qTjTcUamvoUA53wXpqKnYyyI/edit#responses Is It Fair worksheet https://drive.google.com/file/d/1XS0Jt-QAlght_cY4UYOuBBcPxzkRheFJ/view?usp=sharing							
The summative assessment includes these objectives as well as others that are not addressed in these lessons.		x					

Materials, tools and resources: 1-1 iPads,
Unit Plan Author (name, school and optional email address or hyperlink to teacher's web page) Sharon Jerzyk, Washington Technology Secondary School.
Additional credit given to NCTM