Rigorous Curriculum Design
Unit Planning Organizer

Subject:	Math 7			Grade:	7
Unit Number:	4	Unit Name:	**Probability**		
Unit Length	Weeks: 4 ± 1 buffer		Mins / Day: 57 minutes per day		
Unit Synopsis	Students will investigate chance processes and develop, use, and evaluate probability models.				

Math CCSS

Priority Standards

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.

SP 7 Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy

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

Standards for Mathematical Practice

SMP

☐Make sense of problems and persevere in solving them
☐Reason abstractly and quantitatively
☐Construct viable arguments and critique the reasoning of others
☐Model with mathematics
☐Use appropriate tools strategically
☐Attend to precision
☐Look for and make use of structure
☐Look for and express regularity in repeated reasoning

Su pp	Math CCSS

7NS3 Solve real-world and mathematical problems involving the four operations with rational numbers.

7.EE.2 Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related. For example, a + 0.05a = 1.05a means that "increase by 5%" is the same as "multiply by 1.05."

7.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, and predict the approximate relative frequency given the probability.

7.SP.7a - Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events. For example, if a student is selected at random from a class, find the probability that Jane will be selected and the probability that a girl will be selected.

7.SP.7b - Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process.

7.SP.8 a. -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.

7.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.

7.SP.8c - Design and use a simulation to generate frequencies for compound events. For example, use random digits as a simulation tool to approximate the answer to the question: If 40% of donors have type A blood, what is the probability that it will take at least 4 donors to find one with type A blood?

Interd iscipli	Literacy/Science/ History/Other	NG ELD Standards

Mathematics

Mathematics

	ELD.7.I.C.10 - Writing literary and informational texts to present, describe, and explain ideas and information, using appropriate technology **ELD.7.I.B.6** - Reading closely literary and informational texts and viewing multimedia to determine how meaning is conveyed explicitly and implicitly through language **ELD.7.I.B.7** - Evaluating how well writers and speakers use language to support ideas and arguments with details or evidence depending on modality, text type, purpose, audience, topic, and content area

Unwrapped Priority Standards

Standard:	**SP 5 <mark>Understand</mark> 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.**			
Skills	Concepts	Bloom's	DOK	Language Demand
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.**	**Bloom's 2**	**DOK 2**	Interpretive B6 (probability)

Essential Question(s)	Big Idea(s)
If students are absent, how does it change your odds of being called on? Are you more likely to be called on in your math class or your PE class?	Probability is a number from 0 to 1 which shows the likelihood of an event happening.

Standard:	**SP 7 <mark>Develop</mark> a probability model and <mark>use it to find</mark> probabilities of events. <mark>Compare</mark> probabilities from a model to observed frequencies; if the agreement is not good, <mark>explain</mark> possible sources of the discrepancy**			
Skills	Concepts	Bloom's	DOK	Language Demand

Develop
        Use it to find
	a probability model
	        probabilities of events
		Bloom's 6	**DOK 3**	Productive C10 (model, probability)

Compare	probabilities from a model to observed frequencies	bloom's 4	DOK 2	Interpretive B6 (probabilities from a model)
explain	possible sources of the discrepancy if the agreement is not good	bloom's 4	DOK 3	Interpretive B7 (discrepancies and arguments)

Essential Question(s)	Big Idea(s)
Are you guaranteed to flip heads 50% of the time? Why or why not?	It is possible to have a discrepancy between the theoretical probability versus observed probability.

Standard:	SP 8. **Find** probabilities of compound events **using** organized lists, tables, tree diagrams, and simulation.			
Skills	**Concepts**	**Bloom's**	**DOK**	**Language Demand**
Find **Using**	**probabilities of compound events** **organized lists, tables, tree diagrams, and simulation**	**Bloom's 6**	**DOK 3**	Interpretive B6 (probability of compound events)

Essential Question(s)	Big Idea(s)
What is the probability of your parents having a child with curly brown hair?	The probability of a compound event is not the sum but the product of the individual events.

Learning Progressions

Standard:	7 SP 5				
Previous Grade		**Current Grade**		**Next Grade**	
Skills	Concepts	Skills	Concepts	Skills	Concepts
NA		**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**	NA	

		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.		

Standard:	7 SP 7				
Previous Grade		**Current Grade**		**Next Grade**	
Skills	Concepts	Skills	Concepts	Skills	Concepts
NA		**Develop** **Use it to find**	a probability model probabilities of events	NA	
NA		**Compare**	probabilities from a model to observed frequencies	NA	
		Explain	possible sources of the discrepancy if the agreement is not good		

Standard:	7 SP 8				
Previous Grade		**Current Grade**		**Next Grade**	
Skills	Concepts	Skills	Concepts	Skills	Concepts
NA		**Find** **Using**	probabilities of compound events organized lists, tables, tree diagrams, and simulation	Understand Construct and interpret	that patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table. a two-way table summarizing data on two categorical

					variables collected from the same subjects.
				Use	relative frequencies calculated for rows or columns
				to describe	possible association between the two variables.

Unit Vocabulary Words	
Academic Cross-Curricular Vocabulary (Tier 2)	Content/Domain Specific Vocabulary (Tier 3)
Understand	Probability
Develop	Chance event
Compare	Likelihood
Find	Likely event
Explain	Unlikely event
Predict	Odds
Approximate	Theoretical probability
Generate	Observed frequency/probability
	Discrepancy
	Compound event
	Tree diagram
	Sample space
	Outcome
	Simulation
Resources for Vocabulary Development (Strategies, Routines and Activities)	

Word Wall
Flash Cards
Graphic Organizer
      Examples & Non-examples
      Sentence Frames
      The Frayer Model
      Word Pyramid
      Concept Map
Targeted Vocabulary Partner Activity	

21st Century Skills	
☐Creativity and Innovation	☐Initiative and Self-Direction
☐Critical Thinking and Problem Solving	☐Social and Cross-Cultural Skills
☐Teamwork and Collaboration	☐Productivity and Accountability
☐Flexibility and Adaptability	☐Leadership and Responsibility
☐Globally and Financially Literate	☐Curiosity and imagination
☐Effective Oral and Written Communication	☐Accessing and Analyzing Information

Connections between 21st Century Skills, CCCSS, and Unit Overview:

Costa & Kallick, 2008

Unit Assessments	
Pre-Assessment	Post-Assessment
Go to: http://www.alvordschools.org/Page/2698	Go to: http://www.alvordschools.org/Page/2698
Scoring Guides and Answer Keys	
Go to: http://www.alvordschools.org/Page/2698	Go to: http://www.alvordschools.org/Page/2698
Assessment Differentiation	

Students with Disabilities	English Language Learners
Accommodations Reference IEP to ensure appropriate testing environment Allow students to use notes **Modifications** Refer to each students' individual IEPs	Emerging Allow students to use notes Expanding Use sentence frame for constructed response items.

Engaging Scenario Overview (Situation, challenge, role, audience, product or performance)	
Description: You are a consultant for the Game show Deal or No Deal. It is your job to advise the contestant on basic probability and when it is mathematically a good idea to take a deal or not.	Suggested Length of Time Days: Mins/Day:

Engaging Learning Experiences Synopsis of Authentic Performance Tasks		
Authentic Performance Tasks	Description	Suggested Length of Time
Task 1: Consultation	Pre-game show meeting to explain some basic probability to the contestant. (Peer evaluations are an optional way to grade.)	Days: 1-2 Mins/Day: 52
Task 2: Predictions	Now that the Banker has given you an offer, justify to your contestant when they should take the deal or when they should not. Predict what the banker will offer you at any point in the game. (Mars task adaptation)	Days: 1 Mins/Day: 52
Task 3: Compound	Determine the probability of compound activity using a tree diagram.	Days: 1 Mins/Day: 52
Task 4: Play Deal or No Deal	Play the game with the principal as contestant and the class is split into consulting teams.	Days: 1 Mins/Day: 52

Authentic Performance Task 1

Name:	Consultation		Suggested Length	Days: 1-2 Mins/Day: 52

	Priority Standards
Standards Addressed	**CCCSS Math**
	SP 5 <mark>**Understand**</mark> **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.**
	Standards for Mathematical Practice
	☐Make sense of problems and persevere in solving them ☐Reason abstractly and quantitatively ☐Construct viable arguments and critique the reasoning of others ☐Model with mathematics ☐Use appropriate tools strategically ☐Attend to precision ☐Look for and make use of structure ☐Look for and express regularity in repeated reasoning
	Supporting Standards
	CCCSS Math
	7NS3 Solve real-world and mathematical problems involving the four operations with rational numbers. 7.EE.2 Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related. For example, $a + 0.05a = 1.05a$ means that "increase by 5%" is the same as "multiply by 1.05." 7.SP.7a - Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events. For example, if a student is selected at random from a class, find the probability that Jane will be selected and the probability that a girl will be selected. 7.SP.7b - Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process.

Interdisciplinary Connections	Literacy/Science/ History/Other	NG ELD Standards

Teaching and Learning Progression	Basic probability without replacement	Bloom's	DOK
		Scoring Rubric	
		See rubric in APT	

Instructional Strategies			
All Students	SWD	Els	Enrichment
Graphic organizer Use of calculators	***Accommodations*** Refer to each students' individual IEPs ***Modifications*** Refer to each students' individual IEPs	Emerging Clarification of directions by aide or peer in primary language	
		Expanding Clarification of directions by teacher in English	
		Bridging Clarification of directions by student to the teacher	

Authentic Performance Task 2

Name:	Predictions		Suggested Length	Days: 1 Mins/Day: 52
Standards Addressed	Priority Standards			
	CCCSS Math			
	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. **SP 7 Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy**			
	Standards for Mathematical Practice			
	☐Make sense of problems and persevere in solving them ☐Reason abstractly and quantitatively ☐Construct viable arguments and critique the reasoning of others ☐Model with mathematics ☐Use appropriate tools strategically ☐Attend to precision ☐Look for and make use of structure ☐Look for and express regularity in repeated reasoning			
	Supporting Standards			
	CCCSS Math			

7NS3 Solve real-world and mathematical problems involving the four operations with rational numbers.

7.EE.2 Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related. For example, $a + 0.05a = 1.05a$ means that "increase by 5%" is the same as "multiply by 1.05."

7.SP.7a - Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events. For example, if a student is selected at random from a class, find the probability that Jane will be selected and the probability that a girl will be selected.

7.SP.7b - Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process.

Interdisciplinary Connections	Literacy/Science/ History/Other	NG ELD Standards	

Teaching and Learning Progression		Bloom's	DOK
		Scoring Rubric	
		See rubric in APT	

Instructional Strategies			
All Students	SWD	Els	Enrichment
Graphic organizer Use of calculators	***Accommodations*** Refer to each students' individual IEPs ***Modifications*** Refer to each students' individual IEPs	Emerging Clarification of directions by aide or peer in primary language	
		Expanding Clarification of directions by teacher in English	
		Bridging Clarification of directions by student to the teacher	