Marking Period	Unit Title	Recommended Instructional Days								
4	Probability	24 - 30								
Domain										
Strand:										
7.NS.A.3 Solve real-world and mathematical problem	lems involving the four operations with rational numbers.									
7.RP.A.2 Recognize and represent proportional re c. Represent proportional relationships by equations. <i>F</i> relationship between the total cost and the number of i	lationships between quantities. For example, if total cost t is proportional to the number n of item items can be expressed as $t = pn$.	s purchased at a constant price p, the								
7.RP.A.3 Use proportional relationships to solve m gratuities and commissions, fees, percent increase and	nultistep ratio and percent problems. <i>Examples: simple interest, te decrease, percent error.</i>	ax, markups and markdowns,								
7.SP.C.5 Understand that the probability of a char numbers indicate greater likelihood. A probability near likely, and a probability near 1 indicates a likely event	nce event is a number between 0 and 1 that expresses the likelihor 0 indicates an unlikely event, a probability around $\frac{1}{2}$ indicates a.	od of the event occurring. Larger n event that is neither unlikely nor								
7.SP.C.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. 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.										
7.SP.C.7 Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the greement is not good, explain possible sources of the discrepancy. a. Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events. For example, f 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.C.7 Develop a probability model and use it t agreement is not good, explain possible sources of the	to find probabilities of events. Compare probabilities from a mod discrepancy.	el to observed frequencies; if the								



Recommended Activities, Investigations, Interdisciplinary Connections, and/or Student Experiences to Explore NJSLS-CLKS within Unit

Essential Questions:

Module 12:

How can you use experimental probability to solve real-world problems? How can you describe the likelihood of an event? When would an event have a 0 chance of occurring? How do you find the experimental probability of a simple event? How do you find the experimental probability of a compound event? How can all the possible outcomes, or sample space, of a compound event be represented? How can the sample space help you determine the probability? How do you make predictions using experimental probability?

Module 13:

How can you use theoretical probability to solve real-world problems? How do theoretical and experimental probability differ? When might they be the same? How can you find the theoretical probability of a simple event? How do you find the probability of a compound event? How do you make predictions using theoretical probability? How can you use technology simulations to estimate probabilities?

Essential Understandings:

Module 12:

Probability describes the likelihood of an event happening. A ratio of the event occurring to the total number of events describes the probability.

Module 13:

Probability quantifies the likelihood that something will happen and enables us to make predictions and informed decisions.

Vocabulary:

- complement
- event
- experiment
- outcome
- probability
- sample space
- trial

- experimental probability
- simple event
- simulation
- compound event
- theoretical probability

*Encourage students to practice using the unit vocabulary as they talk and write about mathematics. Understanding vocabulary will aid their understanding of the concepts.

Suggested Activity Descriptions:

- Using a bag of Jolly Ranchers, place 10 like colored pieces in various boxes/bags. Tell students that there are 10 in each bag. Then, ask students to come to the front and select from a bag and take note of the color. The goal is for students to begin to notice a pattern and to be able to connect the "likeliness" of selecting various colors to the Jolly Ranchers in the bag. Then, ask students to predict what they think is in the bag. Discuss their predictions as a class.
- Have students roll a die or spin spinners to test the Law of Large Numbers.
- Bring in four t-shirts, three pairs of shorts, and a pair of socks. Use the clothing to model the various options and sketch the sample space.
- GoMATH Unit 6 Review Project: A Birthday Puzzle

[◊]<u>Suggested Sample Tasks</u>:

Activity Description: Card Game

Mrs. Jakeman is teaching her class about probability. She has ten cards, numbered 1 to 10, which she mixes up and stands turned so that the numbers do not show.

Mrs. Jakeman turns the cards around one at a time. The class has to guess whether the next card will have a higher number than the last one turned or a lower number.

The first card turned is a 3.

3								
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1. Would you expect the next number to be higher than 3 or lower? Explain your decision.

The next card is a 10.

2. What is the probability the next card will be a higher

number? Explain.

The next card is number 4.

3	10	4	
5		-	

3. What is the probability the next card is higher? Show your work.

The next card is number 7.

3 10 4 7	
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4. What is the probability the next card is lower? Show your work.

The fifth card is the number 1.

3	10	4	7	1	
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When the sixth card is turned the probability that the following one is higher is the same as the probability that it is lower.

5. What must the sixth card be? Explain how you worked it out.

KEY:

1. higher; there are more cards higher than 3 than lower than 3. .

2. 0 or impossible; All the cards are lower than 10 so it is impossible for the next card to be higher.

September 2022

3. 5/7 or equivalent (71%); 5,6,7,8,9 There are five higher numbers 1 1 2 4.

4. 4/6 or equivalent (66.6%); 1,2,5,6 There are four lower numbers

5. 6; The cards left are 2, 5, 6, 8 and 9. The middle one of these is the 6 leaving two higher and two lower.

Interdisciplinary Connections:

Science:

1. Careers in Math (GoMATH page 361)

2. Curriculum Connection (Biology) Theoretical probability is used in biology to predict the traits of offspring based on parents' traits. A Punnett square can represent the probability of traits such as eye color. The genotype, or genetic makeup, of the parents appears on top of and to the left of the table. In the Punnett square shown, one parent has genotype Rr, and the other has genotype rr. Possible combinations of offsprings' genes are shown in the cells inside the square. The table cells show that the offspring have a 50% chance of having genotype Rr and a 50% chance of having genotype rr. (See corresponding table.) (GoMATH TE page 400)

3. Unit 6 Performance Task #1: A meteorologist predicts a 20% chance of rain for the next two nights, and a 75% chance of rain on the third night. (See corresponding questions.) (GoMATH page 428)

Social Studies:

1. History Connection The birth of modern probability theory can be traced to a famous letter. In 1654, a French nobleman, the Chevalier de Méré, wrote to the renowned philosopher and mathematician Blaise Pascal to seek his advice about a gambling situation. The Chevalier de Méré sometimes bet his friends that he could roll at least one 6 in four rolls of a die. His experience told him that this tended to be a winning proposition, but he asked Pascal to provide a mathematical explanation. This situation provides a good illustration of experimental probability versus theoretical probability. The Chevalier de Méré might have recorded his results and found that he won 52 times out of a total of 100 bets. In this case, the experimental probability of winning is 0.52 or 52%. In general, the experimental probability of an event is the ratio of the number of times an event occurs to the total number of trials. Pascal calculated the probability of winning the bet using theoretical probability. The theoretical probability of an event is the ratio of the number of ways the event can occur to the total number of possible outcomes. For the Chevalier de Méré's situation, this ratio works out to 671/1296 or approximately 0.5177, confirming the chevalier's experience that the chances of winning the bet were slightly in his favor. (GoMATH TE page 361C)

Language Arts:

1. Vocabulary Preview Activity on GoMATH page 362.

2. Reading Startup Activities on GoMATH pages 364 and 396.

*Grade 7 Math/Science Connection

Marking Period: 4 Science Module: B Math Module(s): 13 Topics that Overlap: Probability Science Aspects: Create and analyze Punnett Squares to determine possible outcomes, match punnett square predictions (flip a coin) Skills: Demonstrate how DNA is recombined for the offspring, graphing, tally charts, probability Math Aspects: Students will use Punnett Squares to list the sample spaces for various situations. They will then use their sample spaces to answer various probability questions (such as the probability of someone having blues eyes, the probability of someone having blond hair and blues eyes, the probability of someone not having brown eyes, etc.) Skills: showing the sample space, finding the theoretical probability of simple events, finding the probability of complements, finding the theoretical probability of compound events

Spot Light On: Gladys West

Social and Emotional Learning:	Social and Emotional Learning:
<i>Competencies</i>	Sub-Competencies
SEL Competencies: • Self-Awareness • Social Awareness • Self-Management • Relationship Skills • Responsible Decision-Making	 Recognizing the importance of self-confidence in handling daily tasks and challenges. Demonstrate an awareness of the expectations for social interactions in a variety of ways. Demonstrate an understanding of the need for mutual respect when viewpoints differ. Identify and apply ways to persevere through alternative methods to achieve goals. Utilize positive communication and social skills to interact effectively with others. Develop, implement, and model effective problem solving and critical thinking skills.
Assessments (Formative)	Assessments (Summative)
To show evidence of meeting the standard/s, students will successfully	To show evidence of meeting the standard/s, students will successfully
engage within:	complete:
Formative Assessments: • Teacher Observations • Exit Tickets • Quizzes • Self Assessments • Math Journals • Homework/Classwork • Teacher created assessments	Benchmarks & Summative Assessments: • Chapter/Unit Assessments • Standardized Tests • District Assessments • Project-based Assessments

Differentiated Student Access to Content: Teaching and Learnin <u>g Resources/Materials</u>									
Core Resources	Core Alternate ELL Gifted & Talented Resources Core Resources Core Resources Core Resources IEP/504/At-Risk/ESL IEP/504/At-Risk/ESL IEP/504/At-Risk/ESL								
Go Math Workbook, IXL, Personal Math Trainer, Math on the Spot Videos, My HRW, Khan Academy, Illustrative Mathematics, Learn360, TeacherTube, BrainPOP, Freckle, LearnZillion, MobyMax, 60 minutes of weekly ST Math, Edulastic, Achieve the Core, Desmos	Reteaching worksheets, Skill building workbook, Math nanipulatives, Leveled practice worksheets	Dictionary for native language, Video tutorial in native language, Success for English Learners worksheets, GoMATH Leveled Strategies for English Learners, GoMATH Linguistic Support	ST Math Challenge Objectives, G&T tasks, Enrichment worksheets, Art of Problem Solving, Leveled assessments, GoMATH Teaching for Depth, Math Olympiad						
	Supplement	al Resources							
Technology: • Chromebooks • Scientific/Graphing C Other: • Google Classroom, Google Meets, Sch Manipulatives	alculators (upper grades only) • Online noology, Interactive Workbooks • Illust	math manipulatives rative Mathematics • insidemathematics.	org • National Library of Virtual						
	Differentiated Stude Recommended <u>Stra</u>	nt Access to Content: <u>tegies & Techniques</u>							
Core Resources	Core Alternate ELL Core Gifted & Talented Resources Core Resources Resources Core IEP/504/At-Risk/ESL Core Core								
Deliver instruction utilizing varied learning styles including audio, visual, and tactile/kinesthetic, provide individual instruction as needed, modify assessments and/or rubrics.	Utilize a multi-sensory (VAKT) approach during instruction, provide alternate presentations of skills by varying the method (repetition, simple explanations, additional examples, modeling, etc.), modify test content and/or	Extend time requirements, preferred seating, positive reinforcement, check often for understanding/review, oral/visual directions/prompts when necessary, supplemental materials including use of an online bilingual dictionary, and modified assessment	Create an enhanced set of introductory activities, integrate active teaching/learning opportunities, incorporate authentic components, propose interest-based extension activities,						

Grade 7 Mathematics	September
Unit 6: Probability	2022

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		format, allow students to retake test for additional credit, provide additional times and preferential seating as needed, review, restate and repeat directions, provide study guides, and/or break assignments into segments of shorter tasks.	and/or rubric.	and connect student to related content.			
	Dise	ciplinary Concept(s): Technolo	gy Literacy				
NJSLS CAREER READINESS, LIFE	Cor	e Ideas:	Some digital tools are appropriate for gathering, organizing, analyzing, and presenting information, while other types of digital tools are appropriate for creating text, visualizations, models, and communicating with others.				
LITERACIES & KEY SKILLS	Perj	formance Expectation/s:	9.4.8.TL.2: Gather data and digitally represent information to communicate a real-world problem.				
	Career Readiness, Life Literacies, & Key Skills Practices						
	Act Atte Con Den Util Moo Plar Use Wor	as a responsible and contributing and to financial well-being. sider the environmental, social an nonstrate creativity and innovation ize critical thinking to make sense del integrity, ethical leadership and n education and career paths align technology to enhance productivi k productively in teams while usin	community member and employee. d economic impacts of decisions. a. of problems and persevere in solving th d effective management. ed to personal goals. ty, increase collaboration and communic g cultural/global competence.	em. cate effectively.			

New Jersey Legislative Statutes and Administrative Code (place an "X" before each law/statute if/when present within the curriculum map)									
X	XAmistad Law: N.J.S.A. 18A 52:16A-88Holocaust Law: N.J.S.A. 18A:35-28LGBT and Disabilities Law: N.J.S.A. 18A:35-4.35XDiversity & Inclusion: 								Standards in Action: <i>Climate Change</i>