

Core Content

Cluster Title: Use probability to evaluate outcomes of decisions.
Standard S.MD.1: Use probabilities to make fair decisions (e.g., drawing by lots, using a random number generator).
Concepts and Skills to Master
<ul style="list-style-type: none"> • Simulate random outcomes using various tools. • Analyze the fairness of games by determining the probabilities of the possible outcomes.

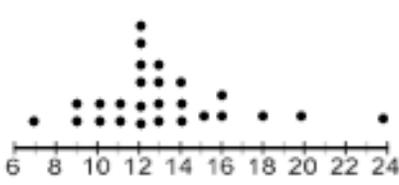
Supports for Teachers

Critical Background Knowledge	
<ul style="list-style-type: none"> • Understand probabilities as chance events (7.SP.5). • Approximate probabilities using experiments (7.SP.6). 	
Academic Vocabulary	
random, random number tables, random number generator, fair decision.	
Suggested Instructional Strategies	Resources
<ul style="list-style-type: none"> • Invent and play games based on random events, such as colored balls in bags, dice, coins, cards. Determine fair outcomes. • Begin to discuss risks in evaluating probabilities. 	<ul style="list-style-type: none"> • “A Fair Game? The Case of Rock, Paper, Scissors,” <i>Mathematics Teaching in the Middle School</i>, December 2008. • “Explorations with Chance” (Grades 9-12 Data): http://illuminations.nctm.org/Lessons.aspx
Sample Formative Assessment Tasks	
<p>Skill-Based Task: Dice #1 has three 1’s and three 6’s. Dice #2 has two 2’s and four 5’s. When the dice are tossed, the set of dice with the highest number wins. Which set of dice is more likely to win?</p>	<p>Problem Task: Vicki and Joyce are playing a dice game with two dice. Vicki gets a point if the sum of the numbers on the dice is even, and Joyce gets a point if the sum is odd. Is this game fair? Explain your reasoning.</p> <p>They get tired of this game and change the rules. Now Vicki gets a point if the product of the numbers on the dice is even and Joyce gets a point if the product is odd. Is this game fair? Explain your reasoning.</p>

Core Content

Cluster Title: Use probability to evaluate outcomes of decisions.
Standard S.MD.2: Analyze decisions and strategies using probability concepts (e.g., product testing, medical testing, pulling a hockey goalie at the end of a game).
Concepts and Skills to Master
<ul style="list-style-type: none"> Recognize that data based on random processes are subject to variability. Analyze experimental designs and sampling strategies. Use the results of experiments and data samples to evaluate decisions. Recognize the limitations of decisions drawn from sample data, based on how the data were produced.

Supports for Teachers

Critical Background Knowledge	
<ul style="list-style-type: none"> Understand probability as a number representing the likelihood of a chance event (7.SP.5). Approximate probabilities using experiments (7.SP.6). Summarize, represent and interpret data on a single count or measurement variable (I.S.ID). Model random processes using probability (I.S.MD.5). 	
Academic Vocabulary	
random, variability, modeling, sample	
Suggested Instructional Strategies	Resources
<ul style="list-style-type: none"> Weigh the contents of many small potato chip packages. Find the numerical summaries of the package weights and plot the results. How do the weights compare to the manufacturer’s claim? How likely is it to get a package at or above the claimed weight? 	“Empty Seats” and other simulation activities: http://education.ti.com
Sample Formative Assessment Tasks	
<p>Skill-Based Task: The plot represents the number of points an individual player scores in each of 26 basketball games. At the next game the player scores 10 points. Is this unusual? Use probability to explain your answer.</p> 	<p>Problem Task: You have to get 65% right on a 20-question true/false quiz in order to pass a class. Can you pass by guessing alone, or do you need to study like crazy? Design a simulation that would test your answer.</p>