

<b>A Roll of the Dice</b> Probability		<b>Student/Class Goal</b> Students often encounter situations in everyday life when the use of probability could be utilized.
<b>Outcome</b> <i>(lesson objective)</i> Students will use experimental probability to determine probabilities and understand mutually exclusive events, complementary events, and conditional probability.		<b>Time Frame</b> ~1.5 hours
<b>Standard</b> <i>Use Math to Solve Problems and Communicate</i>		<b>NRS EFL 6</b>
<b>Components of Performance (COPs)</b> Understand, interpret, and work with pictures, numbers, and symbolic information.	<b>Activity Addresses COPs</b> <i>(process)</i> Students will construct charts.	
Apply knowledge of mathematical concepts and procedures to figure out how to answer a question, solve a problem, make a prediction, or carry out a task that has a mathematical dimension.	Students will use terms and formulas to solve probability problems.	
Define and select data to be used in solving the problem.	Students will be able to extract the data necessary to solve problems	
Determine the degree of precision required by the situation.	Students will be able to make accurate predictions. Students will confirm results using a calculator.	
Solve problem using appropriate quantitative procedures and verify that the results are reasonable.	Students will recognize patterns in data.	
Communicate results using a variety of mathematical representations, including graphs, charts, tables, and algebraic models.	Students will represent results in charts.	
<b>Activity Addresses Benchmarks</b> <i>(content)</i> M.6.25, M.6.24, M.6.26, M.6.27, M.6.28, M.6.29, M.6.30, M.6.31, M.6.32		
<b>Materials</b> Whiteboard, Smart Board, or overhead projector, one pair of dice per two students, blank charts for a single die throw and two dice throw.		
<b>Learner Prior Knowledge</b> Addition, subtraction, multiplication, and division of positive whole numbers, decimals, and fractions.		
<b>Instructional Activities</b> <b>Introduction of topic:</b> The instructor will ask the class for their definition of probability, and then give the definitions of experimental and theoretical probability.  <i>Experimental probability</i> -the probability in which sample data or observations are use to estimate the probability of a specific event occurring. The ratio of the number of times the event happens to the total number of trials.  <i>Theoretical probability</i> -The ratio of the number of favorable outcomes to the total of outcomes possible.  <b>In class assignment:</b> The students will be paired for the in-class assignment. Each pair will be given a set of dice and the chart, "Single Die Throw." The class will talk predict what will happen with the data. The students will keep track of 12 throws (per pair) using only one die, and they will fill in the chart accordingly. The instructor will tally the results for the whole class on the overhead, and provide the class with the following definitions while linking the definition of mutually exclusive events to the single die activity:		

*Mutually exclusive events*-two events that cannot occur at the same time. Example: You cannot roll a 2 and a 4 at the same time.

*Complimentary events*-all possible outcomes other than the favorable one. Example: If you want to roll a 2, what are the odds against rolling a 2? 5:6

The instructor will then link the definition of complimentary events to the next activity, Two Dice Throw. The blank charts will be handed out. The class will talk predict what will happen with the data. This time, the students will have twelve throws using two die. They will track the results on their charts. The instructor will tally results for the whole class on the overhead. The group will discuss the similarities and differences between the group chart and the paired student charts, and they will speculate reasons for the patterns observed in the data.

**Assessment/Evidence** *(based on outcome)*  
SAMS, homework (see attached)

**Teacher Reflection/Lesson Evaluation**  
Not yet completed

**Next Steps**

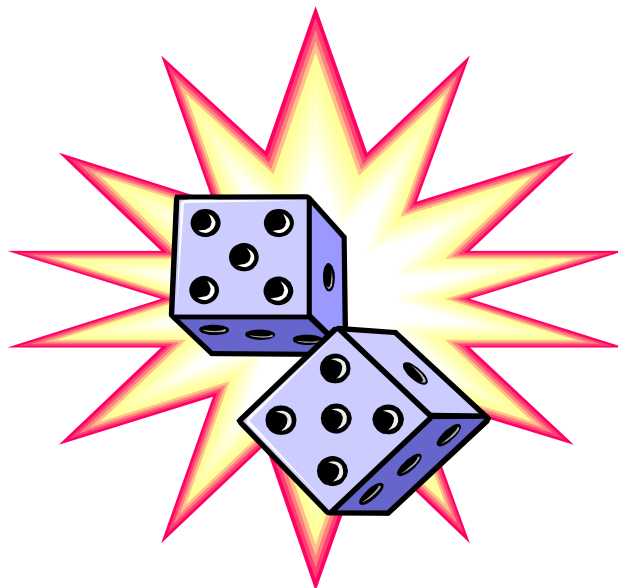
# SINGLE DIE THROW

FACE SHOWING	CORRESPONDING FREQUENCY
1	
2	
3	
4	
5	
6	



# TWO DICE THROW

SUM OF FACES	CORRESPONDING FREQUENCY
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	



## THERE IS A HIGH PROBABILITY YOU WILL HAVE HOMEWORK TONIGHT!

1. Find the probability of drawing a green marble out of a bag containing 9 red marbles, 15 blue marbles, and 12 green marbles.
2. A board game manufacturer realized that of the 7,280 games purchased, 976 were returned due to missing pieces. Find the experimental probability of buying a game with missing pieces.
3. A spinner is labeled with 7 red spheres, 5 blue spheres, 2 green spheres, 10 red cubes, 4 blue cubes, and 8 green cubes. What is the probability of landing on a cube or a red shape?
4. Angela has 3 shirts, 2 sweaters, 4 pairs of slacks, and 2 ties. How many possible outfits can he choose from?
5. There are 3 red marbles, 4 green marbles, 6 blue marbles, and 3 white marbles in a bag. What is the probability of choosing a green marble and then a blue marble from the bag?
6. A business owner hired 15 male sales representatives and 10 female sales representatives. About how many female sales representatives would you expect the owner to hire out of 150 sales representatives?