

Name: _____

Key

Date: _____

Counting Principle and Set Notation Vocabulary

	Definition	Example
Counting Principle	<p>The process used to figure out the total number of ways a combination of events can occur</p> <p>The order of the events does not matter!</p>	<p>Ex. 1 Your school cafeteria offers chicken or tuna sandwiches; chips or fruit; and milk, apple juice, or orange juice. If you purchase one sandwich, one side item and one drink, how many different lunches can you choose?</p> <p style="text-align: center;"><i>$2 \cdot 2 \cdot 3 = 12$ different lunches</i></p>
		<p>Ex. 2 At a sporting goods store, skateboards are available in 8 different deck designs. Each deck design is available with 4 different wheel assemblies. How many skateboard choices does the store offer?</p> <p style="text-align: center;"><i>$8 \cdot 4 = 32$ skateboards</i></p>
Factorials	<ul style="list-style-type: none"> • A factorial is used to multiply a series of descending natural numbers. • The symbol is an “!”. • Useful in combinations when outcomes cannot repeat 	<p>Ex. 3</p> <p style="text-align: center;"><i>$4! = 4 \cdot 3 \cdot 2 \cdot 1 = 24$</i></p>
		<p>Ex. 4 I-Pods can vary the order in which songs are played. Mr. Brookin's iPod currently only contains 8 songs. Find the number of orders in which the songs can be played.</p> <p style="text-align: center;"><i>$8! = 40,320$ song orders</i></p>
Probability	<ul style="list-style-type: none"> • How likely an event will occur • A number from 0 to 1 • Or, as a percentage from 0% to 100% 	<p>The event will not occur; it is impossible.</p> <p style="text-align: center;">↓</p> <p style="text-align: center;">0</p> <p style="text-align: center;">↓</p> <p style="text-align: center;">The event is as likely to occur as it is not to occur.</p> <p style="text-align: center;">↓</p> <p style="text-align: center;">0.5</p> <p style="text-align: center;">↓</p> <p style="text-align: center;">The event is certain to occur.</p> <p style="text-align: center;">↓</p> <p style="text-align: center;">1</p>

Experiment	<p>A process or action that has observable results</p>	<ul style="list-style-type: none"> • Drawing a card from a deck of cards. • Pulling out a marble from a bag of marbles. <ul style="list-style-type: none"> • Rolling a die.
Outcomes	<p>Results from experiments</p>	<ul style="list-style-type: none"> • ALL cards are possible outcomes. • ALL marbles are possible outcomes. <ul style="list-style-type: none"> • ALL the sides of a die.
Sample Space	<ul style="list-style-type: none"> • The set (or list) of ALL possible outcomes • Sometimes called the universal set 	<ul style="list-style-type: none"> • A list of all the 52 cards. • A list of all the marbles in the bag. • A list of all 6 sides of a 6-sided die.
Event	<ul style="list-style-type: none"> • A subset of an experiment • An outcome or set of desired results 	<ul style="list-style-type: none"> • Drawing a 4 of Hearts out of the cards. • Drawing a red marble out of the bag. <ul style="list-style-type: none"> • Rolling a 2 on a 6-sided die.
Set	<ul style="list-style-type: none"> • A well-defined collection of objects. • Each object is called an element. 	<ul style="list-style-type: none"> • $A = \{2, 4, 6, 8\}$ • Set B consists of all integers from 1 to 10. • Set C consists of all dogs with spots.
Subset	<p>A list or collection of items contains within another set</p>	<p>Notation: $A \subset B$ (means all the items in A are also in B)</p>
Empty	<ul style="list-style-type: none"> • A set that has no elements. • "null set", \emptyset 	<ul style="list-style-type: none"> • Drawing a red spade out of the cards. <ul style="list-style-type: none"> • Rolling an 8 on a 6-sided die.