TOPIC: BASIC CONCEPTS OF PROBABILITY

Introduction to Probability

◆ How likely an event is to happen is called the **probability** of the event, written as $P(event)$

  ▸ In general, $P(event) = \dfrac{\#\ of\ times\ event\ occurs}{TOTAL}$

Theoretical Probability	Empirical (Experimental) Probability
	Toss # : 1, 2, 3 — Result: T, H, H
$P(heads) = \underline{\quad\quad}$	$P(heads) = \underline{\quad\quad}$
▸ Based on what **[COULD | DID]** happen	▸ Based on what **[COULD | DID]** happen
▸ Calculated **[BEFORE | AFTER]** events occur	▸ Calculated **[BEFORE | AFTER]** events occur
$P(event) = \dfrac{\#\ of\ outcomes\ with\ event}{\#\ of\ TOTAL\ possible\ outcomes}$	$P(event) = \dfrac{\#\ of\ times\ event\ occured}{TOTAL\ \#\ of\ trials}$

Toss #	1	2	3
Result	T	H	H

EXAMPLE (Theoretical)

When rolling a six-sided die, what is the probability of rolling a number greater than 3?

EXAMPLE (Empirical)

The table below shows the results of rolling a six-sided die 10 times. Given that data, what is the probability of rolling a number greater than 3?

Roll	1	2	3	4	5	6	7	8	9	10
Outcome	6	4	2	5	5	5	6	1	4	5

◆ You may see the possible outcomes of an event expressed as a set, referred to as a **sample space**.

  ▸ For example, the **sample space** of flipping a coin is $S = \{\underline{\quad\quad}\}$

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Given the data below, determine the probability that a person randomly selected from Group 1 will be wearing jeans.

	Group 1	Group 2	Group 3
Wearing Jeans	68	27	17
Not wearing jeans	63	36	89

In your coin purse, you have 3 quarters, 4 nickels, & 2 dimes. If you pick a coin at random, what is the probability that it will be a quarter?