



Essential Question:

What are the basic components of probability?

Questions:

Notes:

DefinitionsEVENT - THE OUTCOME $A =$  the event

ie flipping a coin

Heads  $A = H$ EXPERIMENT - the process used to obtain an outcome.RANDOM EXPERIMENT - outcome is not certain.

Ex) Rolling a fair die

- 1, 2, 3, 4, 5, 6

PROBABILITY - the probability of obtaining a particular outcome is denoted
$$P(A) =$$
 The probability of event  $A$  occurring between 0 and 1
THEORETICAL PROBABILITYIn theory, the probability of rolling 1 on a six-side die is  $\frac{1}{6}$ SAMPLE SPACE - list of possible outcomes  $U$ 

Ex) list the sample space for flipping two coins

 $U = \{HH, TT, HT\}$ 

Set notation

$$n(U) = 3$$

↑  
number of elements in set  $U$

Questions:	Notes:
	The Probability of an Event Occuring:
	$P(\text{EVENT}) = \frac{\text{Ways the event can occur}}{\text{Total Possible outcomes}}$ $= \frac{n(A)}{n(U)}$
	Ex) $P(2 \text{ Heads}) = \frac{1}{3}$ $n(A) = 1$ only 1 HH $n(U) = 3$ HH, HT, TT
	Ex) Flip 4 coins at once. Find the probability of the coins landing Heads up more than twice. getting more than 1 Head
	Sample space $U = \{ \text{HHHH, TTTT, HHHH, HHHH, HHHH, HHHH, HHHH, HHHH} \}$ *order does not matter
	Event $A = \{ \text{HHHH, HHHH, HHHH} \}$
	$P(\text{Getting at least two heads}) = \frac{3}{5}$
	* If the probability of an event is $P$ , in $n$ trials, you would expect the event to occur $n$ times
	Ex) A fair 6-sided die is rolled 20 times. what is the probability of rolling a 1 six times?

\*  $P(\text{rolling a 1}) = \frac{1}{6}$

\*  $P(\text{rolling a 1 in 20 rolls}) = \frac{1}{6} \cdot 20$

I expect to roll a 1 3 times  $= \frac{20}{6} = \frac{10}{3} = 3\frac{1}{3}$

Questions:	Notes: <u>EXPERIMENTAL PROBABILITY</u>
	- used to estimate expected outcomes
	<u>Ex</u> testing faulty components test 20 components and find that 3 are defective
	$P(\text{finding faulty comp}) = \frac{3}{20}$
	= $\frac{\text{number of faulty components}}{\text{number tested}}$
	* relative frequency
	HW 3A p. 67 #1-7