10 CHAPTER SUMMARY

BIG IDEAS

For Your Notebook

Big Idea 1

TEKS a.2

Using Permutations and Combinations

PERMUTATIONS **Order is important**	Permutations of n distinct objects	$n!$	Number of ways to arrange 10 students at 10 desks: $10! = 3{,}628{,}800$
	Permutations of n distinct objects taken r at a time	${}_nP_r = \frac{n!}{(n-r)!}$	Number of ways to arrange 8 students at 10 desks: $\frac{10!}{2!} = 1{,}814{,}400$
	Permutations of n objects where one object is repeated s_1 times, another is repeated s_2 times, and so on	$\frac{n!}{s_1! \cdot s_2! \cdot \ldots \cdot s_k!}$	Number of distinguishable permutations of the letters in STUDENTS: $\frac{8!}{2! \cdot 2!} = 10{,}080$
COMBINATIONS **Order is not important**	Combinations of r objects taken from a group of n distinct objects	${}_nC_r = \frac{n!}{(n-r)! \cdot r!}$	Number of ways to choose 8 students from a set of 10 students: $\frac{10!}{2! \cdot 8!} = 45$

Big Idea 2

TEKS a.1

Finding Probabilities

The following table shows which formula to use when finding probabilities involving two events A and B.

Overlapping Events	Independent Events	Dependent Events
$P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$	$P(A \text{ and } B) = P(A) \cdot P(B)$	$P(A \text{ and } B) = P(A) \cdot P(B \mid A)$

Big Idea 3

TEKS a.1

Constructing Binomial Distributions

For a binomial experiment, the probability of exactly k successes in n trials is

$$P(k \text{ successes}) = {}_nC_k p^k (1-p)^{n-k}$$

where the probability of success on each trial is p.

A binomial distribution shows the probabilities of all possible outcomes in a binomial experiment. The distribution is skewed if $p \neq 0.5$.

Binomial Distribution for $n = 6, p = 0.6$