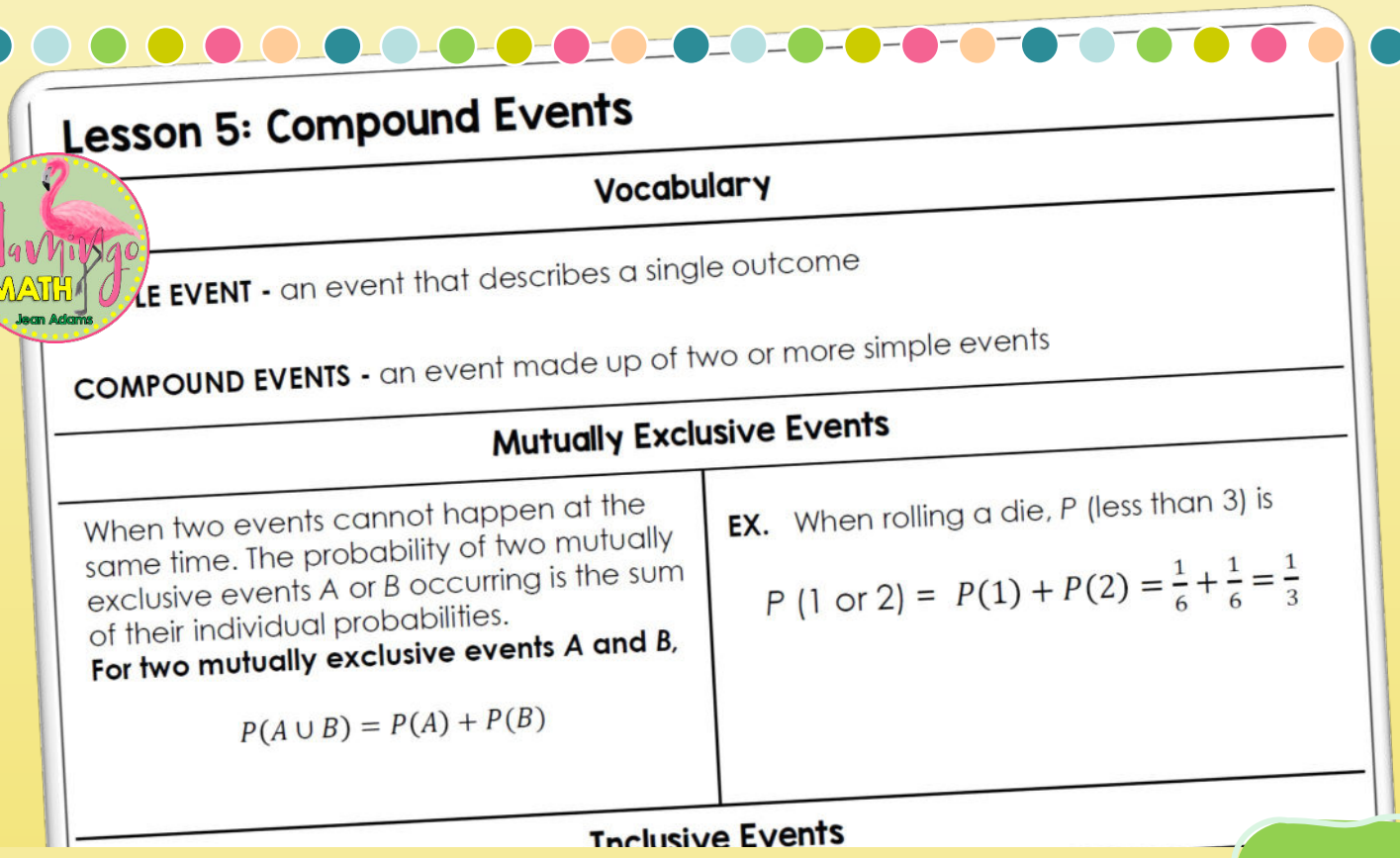
Algebra 2 Honors

Compound Events



Lesson 5: Compound Events

Vocabulary

LE EVENT - an event that describes a single outcome

COMPOUND EVENTS - an event made up of two or more simple events

Mutually Exclusive Events

When two events cannot happen at the same time. The probability of two mutually exclusive events A or B occurring is the sum of their individual probabilities.

For two mutually exclusive events A and B,

$$P(A \cup B) = P(A) + P(B)$$

EX. When rolling a die, P (less than 3) is

$$P\ (1 \text{ or } 2) = P(1) + P(2) = \frac{1}{6} + \frac{1}{6} = \frac{1}{3}$$

Inclusive Events

Completely Editable 12.5

Lesson 12.5: Compound Events

Vocabulary

SIMPLE EVENT - an event that describes a single outcome

COMPOUND EVENTS - an event made up of two or more simple events

Mutually Exclusive Events

When two events cannot happen at the same time. The probability of two mutually exclusive events A or B occurring is the sum of their individual probabilities.
For two mutually exclusive events *A* and *B*,

$$P(A \cup B) = P(A) + P(B)$$

EX. When rolling a die, P (less than 3) is

$$P\ (1 \text{ or } 2) = P(1) + P(2) = \frac{1}{6} + \frac{1}{6} = \frac{1}{3}$$

Inclusive Events

When two events have one or more outcomes in common. The probability of two inclusive events A or B occurring is the sum of their individual probabilities minus the probability of *both* occurring.
For two inclusive events *A* and *B*,

$$P(A \cup B) = P(A) + P(B) - P(A \cap B)$$

EX. When rolling a die,
P (even number or prime) is

P (even or prime) =

$P(even) + P(prime) - P(even\ and\ prime)$

Mutually Ex

EX #1: Are the events below mutually excl

A. Rolling a 3 or a 4 on a number cube.

B. Rolling a prime number or a multiple of 4 on a die.

C. In a deck of 52 cards, drawing a red King or a Black King.

D. Each student can vote for president of Student Government. 32% voted for Sparks, 28% voted for Kolb, and 40% voted for Ramos.

Probability of Mutually Exclusive Events

EX #2: A group of students is donating blood during a blood drive. A student has a $\frac{13}{30}$ probability of having Type-O blood, a $\frac{6}{15}$ probability of having Type-A blood, and a $\frac{2}{15}$ probability of having Type-B blood.

A. What is the probability that a student has Type-O or Type-A blood?

B. What is the probability that a student has Type-A or Type-B blood?

s the probability that you choose a King or a Queen?

Probability of Inclusive Events

EX #4: A card is drawn randomly from a deck of 52. Find the probability of each.

A. Drawing a Queen or a heart?

B. Drawing a black card (Spades or Clubs) or a face card (Jack, Queen, King)

EX #5: Find each probability.

A. Rolling an odd number or a number greater than 2?

B. Rolling at least one 5 when rolling two dice?

Real-World Applicat

EX #6: In a survey of 1600 high school juniors and seni watched the evening news. Only 225 of the e What is the probability that a student was a se

EX #7: From a total of 180 customers at the massage and 63 scheduled a facial appointment. What is the probabilit

Venn

EX #8: In a school survey of 100 students, 4 the schedule from a 7-period day to male. One student is picked at ran

A. Complete Venn diagram at right.

Real-World Application

Remember that the complement of an event with probability p, all outcomes that are not in the event, has a probability of $1 - p$. You can use the complement to find the probability of a compound event.

EX #9: In one day, 6 different people bought purses from Macy's. They offer 48 different purse styles. Find the probability that at least 2 people bought the same style purse.

EX #10: A vending machine offers 10 different drinks. One day 5 employees each purchased a drink from the machine. Find the probability that at least 2 employees purchased the same drink.

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NOTES

Name _____ Date_____

12.5

Compound Events Practice

Problems 1 – 4, find the probability of each event.

1. A pair of dice are rolled. What is the probability that the sum of the numbers rolled is either 7 or 11.

2. A box contains 20 red, 10 blue, and 30 yellow beads. What is the probability of a bead drawn at random being yellow or blue?

3. Two fair dice are thrown. What is the probability that the sum is an even number or a multiple of 3?

4. The numbers 1 – 10 are written on cards and placed in a bag. Find the probability of choosing a number greater than 5 or an odd number.

Problems 5 – 6, Mark wants a snack from a basket that contains 16 items: 5 chips, 6 pretzels, 4 granola bars, and 3 crackers. If Mark is allowed to replace his first choice:

5. What is the probability that he picks a bag of chips and then a package of crackers?

6. What is the probability that he picks pretzels both times?

Problems 7 – 16, find each probability.

7. Of 1650 juniors and seniors surveyed, 930 were seniors and 712 owned a computer. Only 236 of the computer owners were juniors. What is the probability that a student was a senior or owned a computer?

8. When playing poker using a standard deck of 52 playing cards, find the probability of getting a full house. A full house consists of three of one kind and two of another kind.

9. At a vacation resort surf shop the methods of payment for merchandise are recorded each month. If two shoppers in July are chosen at random, what is the probability that both shoppers paid for their merchandise only in cash?

July Sales by Method of Payment	
Credit Only	53%
Half Cash, Half Credit	17%
Some Cash, Some Credit	11%
Cash Only	19%

10. In one day, 5 different people bought a new tennis racquet from the pro shop. The shop carries 35 different tennis racquet models. What is the probability that at least two people bought the same model of racquet?

11. Two integers from 1 through 50 are chosen by a random number generator. Find the probability that both numbers are less than 30.

12. A busy department store has an electronic device used to count shoppers as they enter the store. When two shoppers enter at the same time, there is a 98% chance the first shopper is detected and a 95% chance the second shopper is counted, and a 94% chance that both shoppers are detected.

A. What is the probability that the electronic counter will detect at least one of the shoppers entering together?

B. What is the probability that exactly one of the two shoppers will be detected?

13. A small produce market found that a randomly-chosen shopper buys bananas 24%, tomatoes 36% and both bananas and tomatoes is 11%.

A. Sketch a Venn diagram that summarizes the probabilities.

B. Make a two-way table to summarize the probabilities.

C. Find the probability that a shopper buys bananas or tomatoes.

14. There are six students on the debate team. They will randomly choose a debate topic from a list of 8 current topics of controversy. What is the probability that at least 2 students choose the same type of controversial topic?

15. A widget manufacturer has determined that a machine manufactures 3 faulty widgets for every 1000 it produces. What is the probability that an order of 240 widgets will have one or more faulty units?

A. Both systems function properly?

B. At least one system functions correctly?

Practice Sets

Lesson Warm-Ups

Name	Date	Period
3. *P* (odd or greater than 2)	**4.** *P* (even or prime)	

Name _____ Date _____ Period _____

Lesson 12.5: Compound Events **Warm-Up #2**

A standard number cube is tossed. Find each probability.

1. *P* (5 or odd)	**2.** *P* (even or greater than 2)
3. *P* (odd or less than 5)	**4.** *P* (odd or prime)

Form A

_____

_Period _____

laced in a bag.
hoosing a 9, or

2. Five years after 550 seniors graduated, 370 had a college degree and 270 were married. Half of the students with a degree were married. What is the probability that a student has a college degree or is married?

3. You roll two dice at the same time. What is the probability that the sum of the numbers rolled is even or greater than 10?

Grade:

12.5 Compound Events **Form B**

Name _____

Date _____ Period _____

1. Cards numbered 1-10 are placed in a bag. What is the probability of choosing an 8, or a number less than 5?

2. Five years after 650 seniors graduated, 382 had a college degree and 277 were married. Half of the students with a degree were married. What is the probability that a student has a college degree or is married?

3. You roll two dice at the same time. What is the probability that the sum of the numbers rolled is odd or greater than 8?

Grade:

Daily Lesson Quiz