Algebra 1 – Unit #8 NAME_____

DATA ANALYSIS (DAY 5) NOTES

VOCABULARY

Independent Events (an example of a compound event)	
Definition: two events occur if one event does not affect the occurrence of the other.	Formula: $P(A \text{ and } B) = P(A) \cdot P(B)$
Dependent Events (an example of a compound event)	
Definition: two events occur if one event does affect the occurrence of the other.	Formula: $P(A \text{ and } B) = P(A) \cdot P(B, \text{ assuming } A \text{ occurred})$

EXAMPLES

Decide whether the events are *independent* or *dependent*.

1. Each whole number from 1 through 10 is written on a piece of paper and placed in a hat. You randomly choose a piece of paper, do not put it back, then randomly choose another piece of paper.
   EVENT A: Choose the 5 first.
   EVENT B: Choose an odd number second.
   Dependent events

2. You flip a coin and roll a number cube.
   EVENT A: Get tails when flipping the coin.
   EVENT B: Get a 2 when rolling the number cube.
   Independent events

You roll a red number cube and a blue number cube. Find each probability. SIMPLIFY!

3. P(red 2 and blue 2) $\frac{1}{6} \cdot \frac{1}{6} = \frac{1}{36}$	4. P(red odd and blue even) $\frac{3}{6} \cdot \frac{3}{6} = \frac{9}{36} = \frac{1}{4}$	5. P(red greater than 2 and red 4) $\frac{4}{6} \cdot \frac{1}{5} = \frac{4}{30} = \frac{2}{15}$
6. P(red odd and blue less than 4) $\frac{3}{6} \cdot \frac{3}{6} = \frac{9}{36} = \frac{1}{4}$	7. P(red 6 and blue even) $\frac{1}{6} \cdot \frac{3}{6} = \frac{3}{36} = \frac{1}{12}$	8. P(red greater than 4 and blue greater than 3) $\frac{2}{6} \cdot \frac{3}{6} = \frac{6}{36} = \frac{1}{6}$

10 total marbles

You choose a marble at random from a bag containing 3 blue marbles, 5 red marbles, and 2 green marbles. You replace the marble and then choose again. Find each probability.

9. *P*(both blue)

$\frac{3}{10} \cdot \frac{3}{10} = \frac{9}{100}$

10. *P*(both red)

$\frac{5}{10} \cdot \frac{5}{10} = \frac{25}{100} = \frac{1}{4}$

11. *P*(blue then green)

$\frac{3}{10} \cdot \frac{2}{10} = \frac{6}{100} = \frac{3}{50}$

12. *P*(red then blue)

$\frac{5}{10} \cdot \frac{3}{10} = \frac{15}{100} = \frac{3}{20}$

13. *P*(green then red)

$\frac{2}{10} \cdot \frac{5}{10} = \frac{10}{100} = \frac{1}{10}$

14. *P*(both green)

$\frac{2}{10} \cdot \frac{2}{10} = \frac{4}{100} = \frac{1}{25}$

12 total tiles

You choose a tile at random from a bag containing 2 tiles with X, 6 tiles with Y, and 4 tiles with Z. You pick a second tile without replacing the first. Find each probability.

15. *P*(X then Y)

$\frac{2}{12} \cdot \frac{6}{11} = \frac{12}{132} = \frac{1}{11}$

16. *P*(both Y)

$\frac{6}{12} \cdot \frac{5}{11} = \frac{30}{132} = \frac{5}{22}$

17. *P*(Y then X)

$\frac{6}{12} \cdot \frac{2}{11} = \frac{12}{132} = \frac{1}{11}$

18. *P*(Z then X)

$\frac{4}{12} \cdot \frac{2}{11} = \frac{8}{132} = \frac{2}{33}$

19. *P*(both Z)

$\frac{4}{12} \cdot \frac{3}{11} = \frac{12}{132} = \frac{1}{11}$

20. *P*(Y then Z)

$\frac{6}{12} \cdot \frac{4}{11} = \frac{24}{132} = \frac{2}{11}$

21. **There are 12 girls and 14 boys in math class. The teacher puts the names of the students in a hat and randomly picks one name. Then the teacher picks another name without replacing the first. What is the probability that both students picked are boys?**

26 total students

P(both boys) $= \frac{14}{26} \cdot \frac{13}{25} = \frac{182}{650} = \frac{7}{25} \rightarrow 0.28 \rightarrow 28\%$