

Lesson 6.2 Probability & Punnett Squares

Name _____

Date _____

Period _____

Key Terms

Probability

Punnett square

Genetics



Engage Your instructor will pass out a bag of candy to each group of students. DO NOT eat the candy yet.

Count the number of candies you have in your bag and record the numbers below.

_____ Skittles
 _____ Plain M&Ms
 _____ Peanut M&Ms

Put the candy back in your bag and complete the questions at right.

1. What is the probability of picking out one Skittle from the bag?

$$\frac{\quad}{10} = \quad\%$$

2. One plain M&M?

$$\frac{\quad}{10} = \quad\%$$

3. One peanut M&M?

$$\frac{\quad}{10} = \quad\%$$

4. What is the probability of picking out one plain M&M and then another plain M&M?



Explore I

Your instructor will give you and your partner one penny and one nickel. Follow the instructions below to complete the activity.

1. One partner will flip the penny and the other partner will flip the nickel.
2. Each partner should flip their coin 100 times at the same time.
3. Record the results of the coins tosses below as a series of slashes.

Possible Coin Combinations	Record of Coin Flips	Final Percentage
Heads and Heads (HH)		$\frac{\quad}{100} \times 100 = \quad\%$
Heads and Tails (HT)		$\frac{\quad}{100} \times 100 = \quad\%$
Tails and Tails (TT)		$\frac{\quad}{100} \times 100 = \quad\%$



Explain I

5. What is the probability of getting heads on the nickel?
6. What is the probability of getting heads on the penny (independently)?
7. Which coin combination was the least common?
8. Why do you think that is?
9. What coin combination was the most common?
10. Why do you think that is?



Explore II: Punnett Squares

Scientists have a tool to predict the probabilities you discovered in the Coin Flip activity. This tool is called a Punnett Square and is used often in genetics studies.

	H	T
H		
T		

Fill out the Punnett Square with your instructor. Calculate the probabilities of getting the following combinations using the Punnett Square.

11. HH: $\frac{\quad}{4} \times 100 = \quad\%$

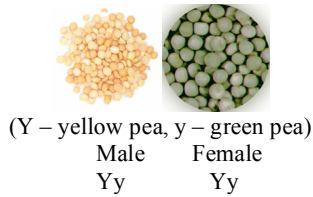
12. HT: $\frac{\quad}{4} \times 100 = \quad\%$

13. TT $\frac{\quad}{4} \times 100 = \quad\%$



Explain II

In the above Punnett square the Heads (H) and Tails (T) represent alleles. Recall in Lesson 6.1 that alleles are alternate forms of the same gene. Scientists use the genes from the mother and father in Punnett Squares to determine the possible *genotypes* (their genes) of their offspring. They then use these genotypes to determine the possible *phenotypes* (physical appearance) of their offspring.



14. Genotypes: _____

15. % _____

16. What are the two possible phenotypes for these peas?

Punnett Square for peas	Female gamete (egg) —	Female gamete (egg) —
Male gamete (sperm) —		
Male gamete (sperm) —		

17. Color the squares that will produce yellow peas yellow and the squares that will result in green peas green.

18. What are the predicted percentages of each phenotype?

19. What is a Punnett Square used for?

20. What is the chance of flipping a coin three times and getting heads all three times? Show your work!!