Genetics with a Smile

Name _____

Wrapping It Up!

(1) How does your smiley face compare to the ones created by your classmates? Pick two smiley faces that are displayed near your smiley face and compare each of the 12 traits. Indicate the phenotype for each smiley face for each trait in the chart.

Trait	My Smiley Face	Smiley by _____	Smiley by _____
Face Shape			
Eye Shape			
Hair Style			
Smile			
Ear Style			
Nose Style			
Face Color			
Eye Color			
Hair Length			
Freckles			
Nose Color			
Ear Color			

(2) Which smiley face has the most dominant traits? _____ How many? _____ traits

(3) Which smiley face has the most recessive traits? _____ How many? _____ traits

(4) Which traits were a result of incomplete dominance?

(5) What is the probability that a smiley face will have a green face? _____ out of _____ or ____ %

(6) How many smiley faces have a green face, which is a recessive trait? _____ out of _____ or ____ %

(7) How does your predicted probability for a green face (#5) compare to the actual results (#6)? Explain.

(8) What is the probability that a smiley face will have an orange nose? _____ out of _____ or ____ %

(9) How many smiley faces have an orange nose? _____ out of _____ or ____ %

(10) How does your predicted probability for an orange nose (#8) compare to the actual results (#9)? Explain.

(11) Why did you only need to flip the male parent coin to determine the sex of your smiley face?

(12) How would the smiley faces change if one of the parents were homozygous dominant for all the traits while the other was heterozygous?

(13) How would the smiley faces change if one of the parents were recessive for all the traits while the other was heterozygous?

(14) Uncle Smiley, who is heterozygous for a yellow face, married a woman with a green face. Both of them have always wanted a large family! If they were to have 12 children, what is the probability that the children would have yellow faces? How many would have green faces? Create a Punnett square to to help you find your answers.

(15) Grandma and Grandpa Smiley are heterozygous for the star eye shape. If one of their heterozygous children married a girl with blast-type eyes, what percentage of their grandchildren should have starry eyes? What percent would have blast-type eyes? Create a Punnett square to help you find your answers.

(16) Baby Smiley has curly hair, but neither of her parents do! Is this possible? Create a Punnett square to help you find your answer.

(17) Aunt Smiley has the cutest pointed ears and would love to have children with pointed ears! What type of ears would her husband need to have in order for her to get her wish? Give the genotype and phenotype as part of your answer.

Genetics with a Smile - Wrapping It Up! Answer Key

(1) How does your smiley face compare to the ones created by your classmates? Pick two smiley faces that are displayed near your smiley face and compare each of the 12 traits. Indicate the phenotype for smiley face for each trait in the chart! Answers will vary.

Trait	My Smiley Face	Smiley by _____	Smiley by _____
Face Shape			
Eye Shape			
Hair Style			
Smile			
Ear Style			
Nose Style			
Face Color			
Eye Color			
Hair Length			
Freckles			
Nose Color			
Ear Color			

(2) Which smiley face has the most dominant traits? Answers will vary. How many? _____ traits

(3) Which smiley face has the most recessive traits? Name the person who created the smiley face for the answers. How many? _____ traits

(4) Which traits were a result of incomplete dominance?

Nose color and ear color

The "yy" genotype would appear in 1 out of 4 boxes of a punnett square.

(5) What is the probability that a smiley face will have a green face? 1 out of 4 or 25 %

(6) How many smiley faces have a green face, which is a recessive trait? Answers will vary. out of ____ or ___ %

(7) How does your predicted probability for a green face (#5) compare to the actual results (#6)? Explain.

Answers will vary.

(8) What is the probability that a smiley face will have an orange nose? 2 out of 4 or 50 %

(9) How many smiley faces have an orange nose? Answers will vary. out of ____ or ___ %

The "RY" genotype would appear in 2 out of 4 boxes of a punnett square.

(10) How does your predicted probability for an orange nose (#8) compare to the actual results (#9)? Explain.

Answers will vary.

(11) Why did you only need to flip the male parent coin to determine the sex of your smiley face?
Since the female parent always contributes an X, the male determines if the smiley will be a female or male and is the only coin that needs to be flipped.

(12) How would the smiley faces change if one of the parents were homozygous dominant for all the traits while the other was heterozygous? The recessive traits would not be observed in any of the smiley faces.

(13) How would the smiley faces change if one of the parents were recessive for all the traits while the other was heterozygous? The recessive traits would observed more often than if both parents were heterozygous.

(14) Uncle Smiley, who is heterozygous for a yellow face, married a woman with a green face. Both of them have always wanted a large family! If they were to have 12 children, how many of the children would have yellow faces? How many would have green faces? Create a Punnett square to to help you find your answers.

	y	**y**
Y	Yy	yy
y	Yy	yy

Each child would have a 50% chance of having a yellow face or a green face. Out of 12 children, it is likely that they would have 6 with yellow faces and 6 with green faces. Since it is a prediction, the actual outcome may vary.

(15) Grandma and Grandpa Smiley are heterozygous for the star eye shape. If one of their heterozygous children married a girl with blast-type eyes, what percentage of their grandchildren should have starry eyes? What percent would have blast-type eyes? Create a Punnett square to help you find your answers.

	e	**e**
E	Ee	Ee
e	ee	ee

The grandchildren would have a 50% chance of having either eye type. Fifty percent of their grandchildren should have starry eyes and fifty percent should have blast-type eyes; however, the actual outcome may vary.

(16) Baby Smiley has curly hair, but neither of her parents do! Is this possible? Create a Punnett square to help you find your answer.

	S	**s**
S	SS	Ss
s	Ss	ss

In order for Baby Smiley to have curly hair, both of her parents would have to be heterozygous for straight hair (Ss). Baby Smiley had a one in four chance (or 25%) to have curly hair.

(17) Aunt Smiley has the cutest pointed ears and would love to have children with pointed ears! What type of ears would her husband need to have in order for her to get her wish? Give the genotype and phenotype as part of your answer.

	v	**v**
v	vv	vv
v	vv	vv

	v	**v**
V	Vv	Vv
v	vv	vv

Aunt Smiley would have a genotype of "v v" to have pointed ears. She would have to have a husband who also has a genotype of "v v", which means he would have pointed ears.

If she had a husband who was heterozygous for curved ears (Vv), she would only have a 50% chance of having children with pointed ears.