Genetics with a Smile

Name _____

Part A: Smiley Face Traits

(1) Obtain two coins from your teacher. Mark one coin with a "F" and the other with a "M" to represent each of the parents. The parents are heterozygous for all the Smiley Face traits.

(2) Flip the coins for parent for each trait. If the coin lands with heads up, it represents a dominant allele. A coin that lands tails up indicates a recessive allele. Record the result for each person by circling the correct letter. Use the results and the Smiley Face Traits page to determine the genotype and phenotype for each trait.

Trait	Female		Male		Genotype	Phenotype
Face Shape	C	c	C	c		
Eye Shape	E	e	E	e		
Hair Style	S	s	S	s		
Smile	T	t	T	t		
Ear Style	V	v	V	v		
Nose Style	D	d	D	d		
Face Color	Y	y	Y	y		
Eye Color	B	b	B	b		
Hair Length	L	l	L	l		
Freckles	F	f	F	f		
Nose Color	R	Y	R	Y		
Ear Color	P	T	P	T		

Part B: Is it a boy or girl?

To determine the sex of your smiley face, flip the coin for the male parent. Heads would represent X, while tails would be Y.

	Female	Male		Genotype	Phenotype
Sex	X	X	Y		

Part C: Create Your Smiley Face!

Use the Smiley Face Traits chart and your results from Part A to create a sketch of your smiley face in the box. Once you have completed the sketch, use the drawing tools in Microsoft Word to create your smiley face!
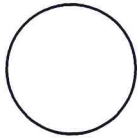
Two things to remember ...

√ Do not add color on the computer! Print a black and white copy and then use crayons or colored pencils to finish it.

√ Don't forget to give your smiley face a name! You will also need to include your name as parent and your class hour.

Genetics with a Smile
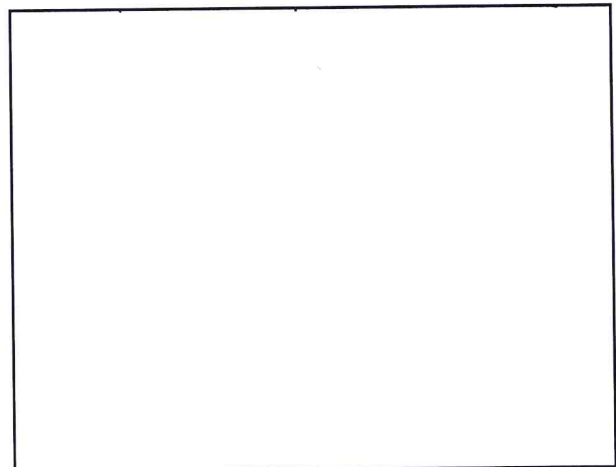
Smiley Face Traits

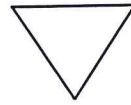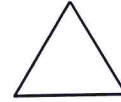**Face Shape**
Circle (C)　　　Oval (c)

Nose Style
Down (D)　　　Up (d)

Eye Shape
Star (E)　　　Blast (e)

Face Color
Yellow (Y)
Green (y)

Eye Color
Blue (B)
Red (b)

Hair Style
Straight (S)　　　Curly (s)

Hair Length
Long (L)
Short (l)

Freckles
Present (F)
Absent (f)

Smile
Thick (T)　　　Thin (t)

Nose Color
Red (RR)
Orange (RY)
Yellow (YY)

Ear Color
Hot Pink (PP)
Purple (PT)
Teal (TT)

Ear Style
Curved (V)　　　Pointed (v)

Sex
To determine the sex, the flip the coin for the male parent. Heads equals X and tails equals Y.

XX - Female - Add pink bow in hair
XY - Male - Add blue bow in hair

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Genetics with a Smile
Wrapping It Up!

Name _____

(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.