

## Genetics with a Smile

### Procedure:

#### 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 Colour	Y y	Y y		
Eye Colour	B b	B b		
Hair Length	L l	L l		
Freckles	F f	F f		
Nose Colour	R Y	R Y		
Ear Colour	P T	P T		

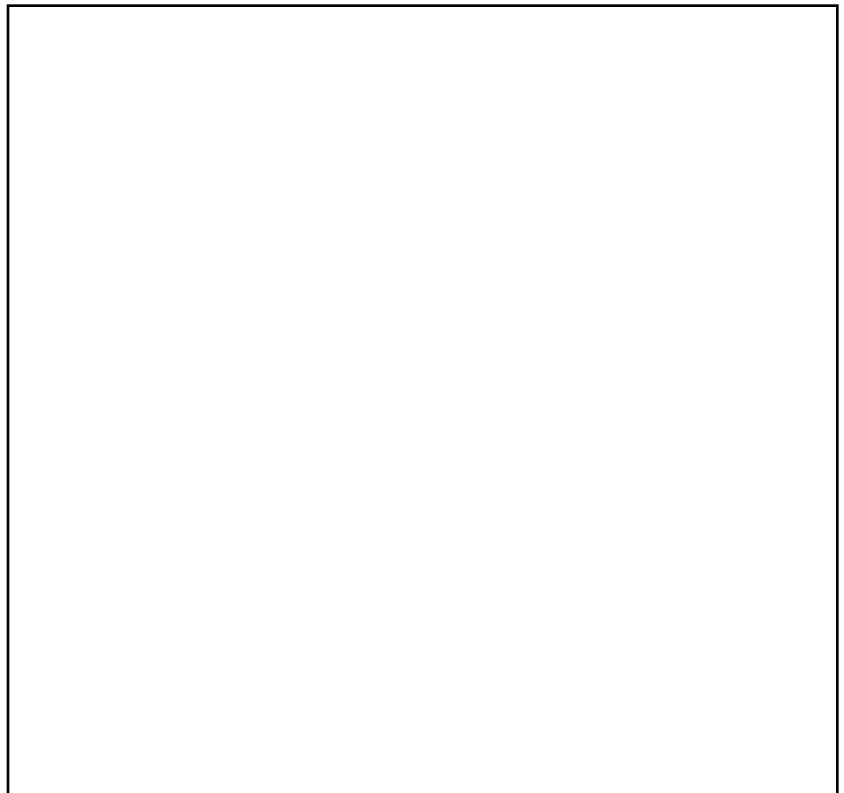
#### Part B: Boy or Girl?

- (1) 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	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.



### Questions:

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 Colour			
Eye Colour			
Hair Length			
Freckles			
Nose Colour			
Ear Colour			

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) What is the probability that a smiley face will have a green face? \_\_\_\_\_ out of \_\_\_\_\_ or \_\_\_\_\_ %

- 5) How many smiley faces have a green face, which is a recessive trait? \_\_\_\_\_ out of \_\_\_\_\_ or \_\_\_\_\_ %
- 6) How does your predicted probability for a green face (#4) compare to the actual results (#5)? Explain.
- 7) What is the probability that a smiley face will have an orange nose? \_\_\_\_\_ out of \_\_\_\_\_ or \_\_\_\_\_ %
- 8) How many smiley faces have an orange nose? \_\_\_\_\_ out of \_\_\_\_\_ or \_\_\_\_\_ %
- 9) How does your predicted probability for an orange nose (#7) compare to the actual results (#8)? Explain.