Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Genetics with a SMILE**

**Part A: Smiley Face Traits**

1. You will flip a coin TWICE for each trait – the first flip will give you the allele from the mother, the second flip will give you the allele from the father.
2. If the coin lands on “*heads*,” record the *dominant* allele from that parent. If the coin lands on “*tails*,” record the *recessive* allele from that parent.
3. Record the result for each parent by circling either the capital (dominant) or lowercase (recessive) letter.
4. Combine the two letters to determine the offspring’s genotype.
5. Write a description of the phenotype that would be seen for each trait.

**circle one in each column**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Trait** | **Mother** | **Father** | **Genotype** | **Phenotype** (describe) |
| Face Shape |  C c | C c |  |  |
| Eye Shape |  E e | E e |  |  |
| Hair Style |  S s | S s |  |  |
| Hair Length |  L l | L l |  |  |
| Ear Style |  V v | V v |  |  |
| Nose Style |  D d | D d |  |  |
| Smile |  T t | T t |  |  |
| Freckles |  F f | F f |  |  |
| Face Color | Y y | Y y |  |  |
| Eye Color | B b | B b |  |  |
| Nose Color | R r | R r |  |  |
| Ear Color | P p | P p |  |  |

**Part B: Is it a boy or a girl?**

The genotype XX = girl. The genotype XY=boy.

Mothers can only give their children an “X” allele. Fathers can give either an allele for “X” or “Y.”

1. Flip the coin ONE time to determine which allele the father gives. (You already know what allele the mother gives.)
2. If the coin lands on “heads,” record “X” from the father. If the coin lands on “tails,” record “Y” from the father.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|   | **Mother** | **Father** | **Genotype** | **Phenotype** (gender) |
| Gender | X |  X Y |  |  |

**Part C: Create Your Smiley Face!**

Use the results you got in Part A and Part B (the front side of this sheet) to draw your smiley face. You may also use pages or word to create your smiley face on your computer! Use the information in the following trait chart to draw the facial features correctly. BE SURE TO GIVE YOUR SMILEY FACE A NAME! ☺

|  |  |  |
| --- | --- | --- |
| Face Shape | C=circle  | c=oval |
| Eye Shape | E=star | e=blast |
| Hair Style | S = straight | s = curly |
| Hair Length | L = long | l = short |
| Ear Style | V=curved  | v=pointed  |
| Nose Style | D= down triangle  | d= up triangle  |
| Smile | T=thick  | t=thin  |
| Freckles | F = freckles | f = NO freckles |
| Face Color | Y = yellow | y = green |
| Eye Color | B = blue | b = red |
| Nose Color | R = red | r = orange |
| Ear Color | P = pink | p = purple |
| Gender | XX = girl\*draw a PINK bow in her hair | XY = boy\*draw a BLUE bow in his hair OR a blue blow tie at his neck |

Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Genetics with a Smile Discussion Questions**

1. Out of the 12 traits listed above (NOT including gender), for how many traits did your smiley face show the dominant gene? How many traits did your smiley show the recessive gene for?
2. In this example, both the mother and father were heterozygous for each trait. How do you think the results of your smiley face might have changed if one of the parents were *homozygous for the dominant genes* for each trait?

1. Explain why you only had to flip the coin ONCE to determine gender.
2. Pick any THREE traits from this smiley face activity and tell how the phenotype might have been different if *incomplete dominance* had happened for each of the traits.