Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date\_\_\_\_\_\_\_\_\_ Period\_\_\_

**The Baby Looks Like Who? Lab**

**PURPOSE:** To understand how alleles (versions of traits) are passed from parent to their offspring by simulating the trait choices in a baby.

**PROBLEM:** \_\_Which parent will an offspring look more like?\_\_

A baby can only get traits from its two parents, so to know what a baby will look like the parents have to figure out their **phenotypes** (appearance) from their **genotypes** (DNA). Even knowing the genotypes, it can be hard to predict who the baby will look like.

Is it hard to predict who a baby will look like? Why or why not? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**HYPOTHESIS:** Working with you partner, which partner will your child look more like or will the child be a good blend of both of you? Why do you think this is? Explain your answer.

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**Probability** is the likelihood, or chance, that an event will happen. Genetics is about figuring out the likelihood the offspring inherits an allele (version of a gene) which then determines a trait.

In this lab you will be flipping coins to see how probability determines which trait the child inherits from a parent.

What was the chance you were going to flip a head or tail on the penny? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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**PROCEDURES:**

**Materials:** Two pennies/person Colored Pencils

**Steps:**

Follow the individual steps on the following pages.

**PROCEDURES:**

1. Use attached chart to find your personal traits and record the genotype on **Data Table 1**. If you are the dominant trait flip the penny to record if you are homozygous or heterozygous (heads = Capitol letter, tails = lowercase letter).
2. Record your partner’s genotype.

**DATA:**

**Table 1: Parent DNA/Genotype**

|  |  |  |
| --- | --- | --- |
| **Trait**  **(Refer to the Trait Chart)** | **\_\_\_\_\_\_\_\_’s**  **Genotype** | **\_\_\_\_\_\_\_\_’s**  **Genotype** |
| Gender (XX = female,. XY = male) |  |  |
| Face Shape (RR or Rr = round, rr = square) |  |  |
| Chin Shape (NN or Nn = noticeable, nn = less noticeable) |  |  |
| Chin Dimple (AA or Aa = absent, aa = cleft) |  |  |
| Freckles (FF or Ff = freckles, ff = none) |  |  |
| Cheek Dimples (DD or Dd = dimples, dd = none) |  |  |
| Lip Thickness (TT or Tt = thick, tt = thin) |  |  |
| Eye Brows (BB or Bb = bushy, bb = fine) |  |  |
| Eye Shape (WW or Ww = wide/almond, ww = round) |  |  |
| Eyelashes (LL or Ll = long, ll = short) |  |  |
| Ear Shape (EE or Ee = large, ee = small) |  |  |
| Ear Lobes (GG or Gg = detached/free, gg = attached) |  |  |
| Widow’s Peak (KK or Kk = widow’s peak, kk = straight) |  |  |
| Hair Curliness (C1C1 = curly, C1C2 = wavy, C2C2 = straight) |  |  |
| Eyebrow Color (J1J1 = darker than hair J1J2 = same as hair, J2J2 = lighter than hair) |  |  |
| Eye Width (U1U1 = close together, U1U2 = average, U2U2 = far apart) |  |  |
| Eye Size (S1S1 = large, S1S2 = medium, S2S2 = small) |  |  |
| Mouth Size (Z1Z1 = wide, Z1Z2 = medium, Z2Z2 = narrow) |  |  |
| Nose Size (O1O1 = small, O1O2 = medium, O2O2 = large) |  |  |
| Birth Mark/Mole (M1M1 = left cheek, M1M2 = right cheek, M2M2 = absent) |  |  |
| Skin Tone (P1P1 = light, P1P2 = medium, P2P2 = dark) |  |  |
| Hair Color (HHCC or HHCc = black, HHcc = red, HhCC = dark brown, HhCc = light brown, Hhcc = dark blond, hhCC or hhCc = blond, hhcc = white) |  |  |
| Eye Color (QQVV or QQVv = deep brown, QQvv = brown, QqVV = greenish brown, QqVv = light brown, Qqvv = gray-blue, qqVV = green, qqVv = blue, qqvv = pink) |  |  |

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| **PROCEDURES:** |

1. Use the Punnett Squares below to predict what your offspring will look like. Highlight or circle the most likely trait
2. Draw a picture of the predicted offspring by using the most likely traits. If a trait is 50% possible, flip the penny to choose which trait will be present. Heads for homozygous and tails for heterozygous.

|  |  |  |  |
| --- | --- | --- | --- |
| Face Shape (RR, Rr or rr) | Chin Shape (NN, Nn, or nn) | Chin Dimple (AA, Aa, or aa) | Freckles (FF, Ff, or ff) |
| |  |  |  | | --- | --- | --- | |  |  |  | |  |  |  | |  |  |  |   Trait: | |  |  |  | | --- | --- | --- | |  |  |  | |  |  |  | |  |  |  |   Trait: | |  |  |  | | --- | --- | --- | |  |  |  | |  |  |  | |  |  |  |   Trait: | |  |  |  | | --- | --- | --- | |  |  |  | |  |  |  | |  |  |  |   Trait: |
| Cheek Dimples (DD, Dd, or dd) | Lip Thickness (TT, Tt or tt) | Eye Brows (BB, Bb or bb) | Eye Shape (WW, Ww, or ww) |
| |  |  |  | | --- | --- | --- | |  |  |  | |  |  |  | |  |  |  |   Trait: | |  |  |  | | --- | --- | --- | |  |  |  | |  |  |  | |  |  |  |   Trait: | |  |  |  | | --- | --- | --- | |  |  |  | |  |  |  | |  |  |  |   Trait: | |  |  |  | | --- | --- | --- | |  |  |  | |  |  |  | |  |  |  |   Trait: |
| Eyelashes (LL, Ll, or ll) | Ear Shape (EE, Ee, or ee) | Ear Lobes (GG, Gg, or gg) | Widow’s Peak (KK, Kk, or kk) |
| |  |  |  | | --- | --- | --- | |  |  |  | |  |  |  | |  |  |  |   Trait: | |  |  |  | | --- | --- | --- | |  |  |  | |  |  |  | |  |  |  |   Trait: | |  |  |  | | --- | --- | --- | |  |  |  | |  |  |  | |  |  |  |   Trait: | |  |  |  | | --- | --- | --- | |  |  |  | |  |  |  | |  |  |  |   Trait: |
| Hair Curliness (C1C1, C1C2, C2C2) | Eyebrow Color (J1J1, J1J2, J2J2) | Eye Width (U1U1, U1U2, U2U2) | Eye Size (S1S1, S1S2, S2S2) |
| |  |  |  | | --- | --- | --- | |  |  |  | |  |  |  | |  |  |  |   Trait: | |  |  |  | | --- | --- | --- | |  |  |  | |  |  |  | |  |  |  |   Trait: | |  |  |  | | --- | --- | --- | |  |  |  | |  |  |  | |  |  |  |   Trait: | |  |  |  | | --- | --- | --- | |  |  |  | |  |  |  | |  |  |  |   Trait: |
| Mouth Size (Z1Z1, Z1Z2, Z2Z2) | Nose Size (O1O1, O1O2, O2O2) | Birth Mark/Mole (M1M1, M1M2, M2M2) | Skin Tone (P1P1, P1P2, P2P2) |
| |  |  |  | | --- | --- | --- | |  |  |  | |  |  |  | |  |  |  |   Trait: | |  |  |  | | --- | --- | --- | |  |  |  | |  |  |  | |  |  |  |   Trait: | |  |  |  | | --- | --- | --- | |  |  |  | |  |  |  | |  |  |  |   Trait: | |  |  |  | | --- | --- | --- | |  |  |  | |  |  |  | |  |  |  |   Trait: |
| Hair Color  (HHCC, HHCc, HHcc, HhCC, HhCc, Hhcc, hhCC, hhCc, hhcc) | | Eye Color  (QQVV, QQVv, QQvv, QqVV, QqVv, Qqvv, qqVV, qqVv, qqvv) | |
| |  |  |  | | --- | --- | --- | |  |  |  | |  |  |  | |  |  |  | | |  |  |  | | --- | --- | --- | |  |  |  | |  |  |  | |  |  |  | | |  |  |  | | --- | --- | --- | |  |  |  | |  |  |  | |  |  |  | | |  |  |  | | --- | --- | --- | |  |  |  | |  |  |  | |  |  |  | |
| Multiply each genotype of h’s by each genotype of c’s to find the most likely trait.  Trait: | | Multiply each genotype of q’s by each genotype of v’s to find the most likely trait.  Trait: | |

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| **PROCEDURES:** |

1. Draw a picture of the predicted child in **Data Table 2**. Make the drawing look like a human baby.

Data 2: Draw the predicted offspring!

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| **PROCEDURES:** |

1. Determine the genotype of the baby for each of the traits based on what one allele each parent gives the baby. If you are heterozygous flip the coin, heads = Capitol letter, tails = lowercase letter. If you are homozygous dominant or recessive you do not need to flip the coin. Record the baby’s genotype in **Data Table 3**.
2. **For Hair Color and Eye Color each person needs to record 2 letters for the trait, so flip TWICE!**

**Table 3: Determine Genotype and Phenotype of Child**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Trait** | **\_\_\_\_\_\_\_’s Genes** | **\_\_\_\_\_\_\_’s Genes** | **Baby’s Genotype** | **Baby’s Phenotype** |
| Gender  \*If you are the same gender, one person flip the penny to represent the male gender. |  |  |  |  |
| Face Shape |  |  |  |  |
| Chin Shape |  |  |  |  |
| Chin Dimple |  |  |  |  |
| Freckles |  |  |  |  |
| Cheek Dimples |  |  |  |  |
| Lip Thickness |  |  |  |  |
| Eye Brows |  |  |  |  |
| Eye Shape |  |  |  |  |
| Eyelashes |  |  |  |  |
| Ear Shape |  |  |  |  |
| Ear Lobes |  |  |  |  |
| Widow’s Peak |  |  |  |  |
| Hair Curliness |  |  |  |  |
| Eyebrow Color |  |  |  |  |
| Eye Width |  |  |  |  |
| Eye Size |  |  |  |  |
| Mouth Size |  |  |  |  |
| Nose Size |  |  |  |  |
| Birth Mark/Mole |  |  |  |  |
| Skin Tone |  |  |  |  |
| Hair Color |  |  |  |  |
| Eye Color |  |  |  |  |

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| **PROCEDURES:** |

1. Draw a picture of your baby and give the child a name in **Data Table 4**. Make the drawing look like a human baby.

Data 4: Draw the offspring!

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**ANALYSIS:**

1. How well do you think you could have predicted your genotype (DNA) from knowing your phenotype (Physical appearance) for a trait? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. In the hypothesis you predicted that your offspring might look a certain way. Was your prediction accurate? If so, could your results have been different? Explain by based on the data. If not, explain why your results did not match your prediction. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. Based on this lesson, which of your traits are more likely to be passed down to multiple generations? Using the data you have collected, support this statement. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. Explain how probability relates to genetics? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
5. How could predicting traits be useful? Write a paragraph explaining how these predictions could be used.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_