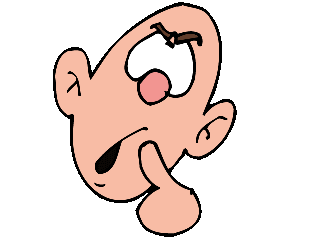
Parents \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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



Variations on a Human Face

**Materials**: 2 pennies, chart on human traits

1. First determine which partner will toss for the male and which will toss for the female. Each of you will get a penny.

2. Have the partner who is representing the male flip the coin, if the coin lands heads up, the offspring is female, if tails, the offspring is male. **What is the sex of your offspring?**\_\_\_\_\_\_

3. For all coin tosses from now on. **Heads will represent the dominant allele and tails will represent the recessive allele.** For each trait on the chart you will flip a coin to determine what GENOTYPE your offspring will have. Put a check in the box that represents your offspring.

**Polygenic Traits**

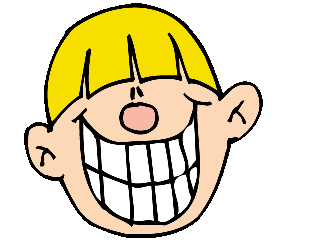
– some traits are controlled by more than one gene and are called polygenic. Hair, eye color and skin color are examples of polygenic traits. To determine the color of your child’s hair and eyes, you will flip your coins twice, once to represent the A gene, and once to represent the B gene.

Example: Flip 1 Head / Head Flip 2 Head / Tail

Genotype A A B b

4. **Hair Color** -- What did you flip? Flip 1 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Flip 2 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Circle your genotype and hair color.

If the genotype is…. The hair color is…

AABB black

AABb black

AAbb red

AaBB brown

Aabb regular blonde

AaBb brown

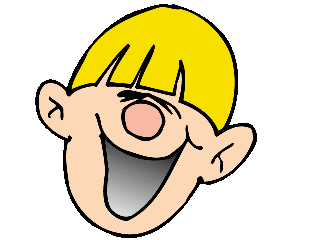
aaBB dark blonde

aaBb regular blonde

aabb pale yellow blonde

5. **Eye Color** -- What did you flip? Flip 1 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Flip 2 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

If the genotype is…. The eye color is….

 AABB dark brown

AABb dark brown

AAbb brown

AaBB brown with green flecks

AaBb brown

Aabb gray-blue

aaBB green

aaBb dark blue

aabb light blue (hazel)

6. **Skin Color** – skin color is controlled by a lot of different genes that basically add together to determine how dark the skin is and variations in tone. To simulate how skin color might be determined. Flip a single coin 10 times. Each time the coin turns up heads, give your offspring a point. Add your points together. 10 pts would be a very dark child and 1 pt would be a very pale child. How many points does your child have? \_\_\_\_\_\_\_\_\_\_

**DRAW YOUR CHILD**

Now that you have determined all the traits of your child, **draw a picture**. Use colors and try to make the sketch as accurate as possible given the traits your child inherited. Make sure you name your child too!

**Analysis and Conclusions**

1. What are the odds that your child will be a boy? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Which parent determines the sex of the child? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2. In your cross, both of the parents have wavy hair and round faces. How is it possible that the child of this cross could have neither of these traits?

3. Which traits are codominant or incompletely dominant ? (these traits don’t have a clear dominant or recessive, the heterozygous condition shows a “blending” or a “middle” condition). List at least three.

4. Why did you have to flip the coin twice to determine hair and eye color?

5. Show the cross of a wavy haired person with a wavy haired person. Use a Punnet square. What percentage of the offspring will have straight hair? \_\_\_\_\_\_\_\_

What percentage of the offspring will have wavy hair? \_\_\_\_\_\_\_\_

What percentage of the offspring will have curly hair? \_\_\_\_\_\_\_\_

\*What type of hair did your child have?

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

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Human Variations | | | |  | Trait | Dominant  (both heads) | Hybrid (one head, one tail) | Recessive (both tails) |
| Trait | Dominant  (both heads) | Hybrid (one head, one tail) | Recessive (both tails) |  | Length of Eyelashes | eyelashes_long  Long (LL) | eyelashes_long  Long (Ll) | eyelashes_short  Short (ll) |
| Shape of Face | faceshape_round  Round (RR) | faceshape_round  Round (Rr) | faceshape_square  Square (rr) |  | Shape of Eyebrows | eyebrows_bushy  Bushy (BB) | eyebrows_bushy  Bushy (Bb) | eyebrows_fine  Thin (bb) |
| Cleft in Chin | cleft_absent  Absent (CC) | cleft_absent  Absent (Cc) | cleft_present  Present (cc) |  | Position of Eyebrows | eyebrowposition_notconnected  Not connected (NN) | eyebrowposition_notconnected  Not connected (Nn) | eyebrowposition_connected  Connected (nn) |
| Hair | hair_curly  Curly (HH) | hair_wavy  Wavy (Hh) | hair_straight  Straight (hh) |  | Size of Nose | nosesize_large  Large (NN) | nosesize_medium  Medium (Nn) | nosesize_small  Small (nn) |
| Widow’s Peak | widow_present  Present (WW) | widow_present  Present (Ww) | widow_absent  Absent (ww) |  | Shape of Lips | lips_thick  Thick (TT) | lips_normal  Medium (Tt) | lips_thin  Thin (tt) |
| Spacing of Eyes | eyes_close  Close (EE) | eyes_normal  Normal (Ee) | eyes_far  Far (ee) |  | Size of Mouth | mouth_large  Large (LL) | mouth_medium  Medium (Ll) | mouth_small  Small (ll) |
| Shape of Eyes | eyeshape_almond  Almond (AA) | eyeshape_almond  Almond (AA) | eyeshape_round  Round (aa) |  | Size of Ears | ears_largeLarge (LL) | ears_normalMedium (Ll) | ears_smallSmall (ll) |
| Position of Eyes | eyeposition_straight  Straight (SS) | eyeposition_straight  Straight (Ss) | eyeposition_slant  Slant (ss) |  | Freckles | freckles_present  Present (FF) | freckles_present Present (Ff) | freckles_absent  Absent (ff) |
| Size of eyes | eyesize_large  Large (LL) | eyesize_medium  Medium (Ll) | eyesize_small  Small (ll) |  | Dimples | dimples_present  Present (DD) | dimples_present  Present (Dd) | dimples_absent  Absent (dd) |