

Laboratory

Exploring Hereditary Traits

Objective

To determine your possible genotypes for some inherited traits

Process Skills

Observing, communicating, inferring

Materials

Pencil, paper, phenylthiocarbamide paper

Method

- 1 Make a table with three columns and nine rows. Head the columns *Trait*, *Phenotype*, and *Possible Genotypes*. Down the first column list the ten traits shown below.
- 2 In the second column of the table, you will write *yes* or *no* depending on whether or not you possess each trait. Work with a partner. For traits that you cannot observe directly, ask your partner for help. Each of the traits listed is controlled by a dominant allele.
 - *Tongue-rolling* (R): Stick out your tongue and try to roll up the sides so that the tongue forms a U-shape.
 - *Free earlobe* (F): The lobe of the ear hangs freely below the point of attachment to the head.
 - *Widow's peak* (W): The midpoint of the hairline along the front of the forehead points downward.
 - *Straight thumb* (N): When extended from the palm of the hand, the top segment of the thumb forms a straight line with the bottom segment. (See figure.)
 - *Straight little finger* (S): The last segment of the little finger forms a straight line with the rest of the finger rather than bending toward the ring finger.
 - *Left-over-right thumb crossing* (L): When the hands are folded in a natural fashion, the left thumb crosses over the right.



- *Chin cleft* (C): The center of the chin has an indentation resembling a deep dimple.
- *Mid-digital hair* (H): Hair is present on the middle section of any of the fingers.
- *Six-fingers* (B): Six fingers are present on either hand (or were present at birth).

- 3 In the third column of the table, record your possible genotypes for each trait, using the appropriate symbols.
- 4 Compare your traits with those of your classmates. Note the trait or traits that are most prevalent among your classmates.

Conclusions

- 1 Do any two people in the class have exactly the same combination of phenotypes for the traits studied?
- 2 Is there evidence that a trait shared by most of the population is not controlled by a dominant allele?

Inquiry

Review all the traits studied. Then discuss with the class the possible adaptive advantage of each of the traits.