



# A Tree of Genetic Traits

## ABSTRACT ↴

Individuals mark traits for tongue rolling, PTC tasting and earlobe attachment on tree leaf cut outs then place the leaves on the appropriate branch of a large tree to organize them by trait combination. When completed, the tree forms a visual representation of the frequency of trait combinations within a group. Can be used with groups of any size.

## LEARNING OBJECTIVES ↴

- An individual's overall combination of traits makes them unique.
- Some traits are more common in a population than others.
- Some *combinations* of traits are more common in a population than others.

## LOGISTICS ↴

### TIME REQUIRED

- Class time: 30 min.
- Prep time: 20 min.

### MATERIALS

- Paper, scissors and tape
- PTC paper
- Hard candies (optional)

### PRIOR KNOWLEDGE NEEDED

- None

### APPROPRIATE FOR

Primary   Intermediate   Secondary   College





# A Tree of Genetic Traits

## CLASSROOM IMPLEMENTATION ↴

### PREPARATION

- Purchase PTC paper from a supply company such as Sargent Welch ([www.sargentwelch.com](http://www.sargentwelch.com)), Carolina Math and Science ([www.carolina.com](http://www.carolina.com)) or Ward's Natural Science (<http://www.wardsci.com>).
- Download the leaf cut-outs and Tree of Genetic Traits format that best fit your needs from the Teach.Genetics website.

<http://Teach.Genetics.utah.edu> > Print-and Go Index > Heredity and Traits > A Tree of Genetic Traits

### ACTIVITY INSTRUCTIONS

- Post the Tree of Genetic Traits in a area of the room that is easily accessible and hand out materials. Explain that traits are observable characteristics we inherit from our parents. Demonstrate the tongue rolling and earlobe attachment traits. Have each individual mark "yes" or "no" on their leaf for these.
- At your prompt, have students place the PTC paper on the tip of their tongue to see if they can taste anything. The chemical tastes bitter to those who can taste it. For those who cannot taste PTC, the paper has no taste.
- Instruct students to check "yes" or "no" on their leaves for PTC tasting. Hand out a hard candy to neutralize the taste of the PTC.
- Demonstrate how to determine where to place the leaves on the Trait Tree starting at the base of the branches and working your way out toward the tips.
- Call students up in groups to place their leaves on the appropriate branches. The leaves will be clustered around the branch representing the most common combination of traits in the class. Some branches of the tree will remain relatively sparse.
- Optional: Make leaf cut-outs in two different colors, one for males and one for females, to track combinations of traits within the different genders.
- Optional: Increase your data pool by including other classes or groups in the exercise, taping all leaves to one tree.

### DISCUSSION POINTS

- Some traits are more common in a population than others. What is the most common combination of traits in the class? What is the least common combination of traits in the class? How does this compare to the most and least common individual traits in the class?
- Every person has a unique combination of traits. If we were to look at more traits than three, we would eventually need a branch on the Trait Tree for each person in the class.

### MATH EXTENSION

## QUANTITIES ↴

### PER INDIVIDUAL:

- One leaf cut-out (see right)
- Hard candy, and one piece of PTC paper.

### WHOLE GROUP

- Tree of Genetic Traits (see right)
- Transparent tape

- Create a bar graph of the class data (see example at right). Use the graph to discuss mean, median, mode and range.

## ACKNOWLEDGEMENTS

Created by the Genetic Science Learning Center.

Adapted from "State Your Traits - Genetic Traits Tree", The GENETICS Project, University of Washington (2001).

Funding was provided by a Howard Hughes Medical Institute Precollege Science Education Initiative for Biomedical Research Institutions Award (Grant 51000125).

Funding for significant revisions: Grant U33MC00157 from the Health Resources and Services Administration, Maternal and Child Health Bureau, Genetic Services Branch. Partners in the Consumer Genetics Education Network (CGEN) include HRSA, March of Dimes, Dominican Women's Development Center, Charles B. Wang Community Health Center, Genetic Science Learning Center at University of Utah, Utah Department of Health and the National Human Genome Center at Howard University.

## PERMISSIONS

Please see: <http://learn.genetics.utah.edu/permissions/> to read our Permissions Policy.