

An Inventory of My Traits

Abstract

Students take an inventory of their own easily-observable genetic traits. Working in small groups, they observe how their trait inventories differ from those of others. Students record their observations in a data table and make a bar graph to show the most and least common traits in the group.

Learning Objectives

- Traits are observable characteristics that are passed down from parent to child.
- An individual will have many traits they share in common with others.
- An individual's overall combination of traits makes them unique.
- Some traits are more common in a population than others.

Estimated time

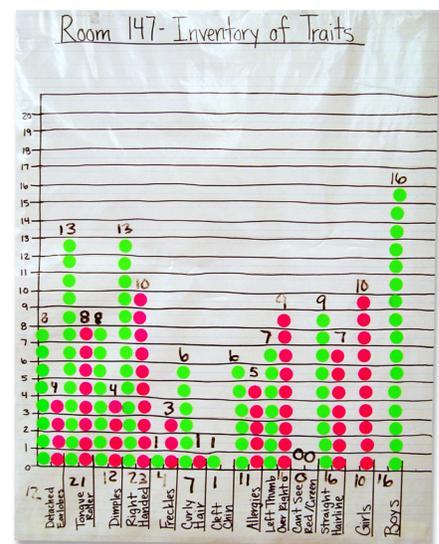
- Class time 30 minutes
- Prep time 20 minutes

Materials

- Copies of student pages

Instructions

1. Begin by demonstrating one of the traits listed in An Inventory of My Traits: Survey (page 1). Ask students who possess this trait to stand. Point out the relative numbers of students standing and sitting for the trait. Continue this process with 2-3 more traits.
2. Explain that traits are observable characteristics we inherit from our parents. Some traits are common in a population (our class) while others are not. And, every person has a different overall combination of traits that makes them unique.
3. Divide students into groups of four or more. Have each student in the group complete An Inventory of My Traits: Survey to determine their unique combination of the traits described.
4. After students complete the survey, have them tally their group information on the data table (page 2) and draw a bar graph (page 3).
5. Optional: You may collect the traits data from the whole class by creating a large wall chart (see example on the rightw). Have a representative from each group fill in their data. Once all the data has been collected, have the students make a bar graph from the class data or make one large graph together.



Optional Activity

- a. Ask students to predict how many traits they would have to look at on the Survey in order to identify any given classmate as unique.
- b. Select a volunteer who would like to determine his or her uniqueness. Ask all students to stand.
- c. Have the volunteer call out one of their traits at a time, beginning with question 1 on the Survey and continuing in sequence. For each trait, direct all students who do not share that trait to sit down; students who share the trait remain standing. Once a student sits down, they do not get up again.
- d. Continue in this way until the volunteer is the only one standing. Count the number of traits it took to distinguish the volunteer from everyone else in the class. Compare this number with the students' predictions.
- e. Repeat with several additional volunteers.

Math Extension

Have students practice converting fractions to decimals, then decimals into percentages by calculating the frequency of the following traits in your classroom: tongue rolling, handedness and hand clasping.

Students can then compare their calculated frequencies with those for the general population (provided in the table below).

Example: $\frac{\# \text{ of students with the trait}}{\# \text{ of students in the class}} \times 100 = \text{_____}\%$

$$\frac{15 \text{ tongue rollers}}{21 \text{ students in the class}} \times 100 = 71\%$$

Trait	Frequency in general population *
Tongue Rolling	Can roll tongue - 70% Cannot roll tongue - 30%
Handedness	Right handed - 93% Left handed - 7%
Hand clasping	Left thumb on top - 55% Right thumb on top - 44% No preference - 1%

* Frequencies obtained from the Online Mendelian Inheritance in Man (<https://www.ncbi.nlm.nih.gov/omim>)

Misconceptions to watch for

- Students may think that the more common traits are “better”, but this is not always the case. Sometimes traits simply show up more frequently in the human population.
- More advanced students may think that dominant traits are more common than recessive traits. However, frequency has very little to do with whether a trait is dominant or recessive. That is, a dominant trait is not necessarily more common and a recessive trait is not necessarily rare in a population.

References

This activity was adapted from: “Alike But Not The Same” in Human Genetic Variation, NIH Curriculum Supplement Series (1999). Available at <http://science-education.nih.gov/customers.nsf/high-school.htm>.

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