

Biology 3A Laboratory
Population Genetics Worksheet

Name: _____
 Lab Day & Time: _____

1. Calculate the allelic and genotypic frequencies for the PTC Taste Test. **Show your work.**

Individual Results: Taster _____ Nontaster _____
 Class Results: Number of tasters _____ = _____% (TT + Tt)
 Number of non tasters _____ = _____% (tt)
 Total _____

$q^2 =$ _____ $q =$ _____ Frequency of *t* allele = _____
 $1 - q = p \rightarrow$ frequency of *T* allele = _____
 $p^2 =$ genotype of *TT* = _____% of the class
 $2pq =$ genotype of *Tt* = _____% of the class

2. If a class member is known to be a taster, what is the chance that he or she is homozygous for the *T* allele?

3. Calculate the allelic and genotypic frequencies for the Sodium Benzoate (SB) Taste Test. **Show your work.**

Individual Results: Taster _____ Nontaster _____
 Class Results: Number of tasters _____ = _____% (BB + Bb)
 Number of non tasters _____ = _____% (bb)
 Total _____

$q^2 =$ _____ $q =$ _____ Frequency of *b* allele = _____
 $p = 1 - q \rightarrow$ frequency of *B* allele = _____
 $p^2 =$ genotype of *BB* = _____% of the class
 $2pq =$ genotype of *Bb* = _____% of the class

4. Fill in Table 1: Summary table for PTC and SB taste test for your **LAB section**.

Trait	TT (p^2)	Tt ($2pq$)	Tt (q^2)
PTC			
SB			

5. Fill in Table 2: Summary table for PTC and SB taste test for **ALL sections**.

Trait	TT (p^2)	Tt ($2pq$)	Tt (q^2)
PTC			
SB			

6. **Explain** if the gene frequencies determined represent a realistic assessment of any population.

7. How might you go about the process of determining the frequency of alleles in a more realistic population?

8. Run the Chi squared analysis from the webpage (<http://www.graphpad.com/quickcalcs/chisquared1.cfm>), compared with the 0.25 (+/+), 0.50 (+/-) and 0.25 (-/-) genotypic ratio for **a)** your lab section and **b)** all sections for both the PTC and SB data you recorded on Table 1 and 2.

9. **Using Excel:** NOTE: Fit both graphs on the same page
a) on the same graph, plot the genotypic frequencies for your lab section AND all lab sections regarding the PTC data
b) on the same graph, plot the genotypic frequencies for your lab section AND all lab sections regarding the SB data
c) include the Chi squared values in your figure caption from #8 for the PTC and SB data