

Amoeba Sisters Video Recap: Pedigrees
Autosomal Recessive Pedigree

Handwritten scribbles and initials "L.A.M."

Directions: Consider a pedigree that is tracking an autosomal recessive trait, where two recessive alleles (tt) result in the inability to taste a chemical known as PTC. The ability to taste PTC is determined by the presence of a dominant allele (T). Complete the missing boxes in the chart. The first row has been done for you as an example!

*Note: The ability to taste PTC may be more complex than a simple gene trait.

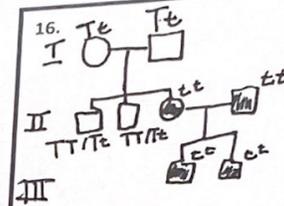
	Individual Phenotype	Shape (in Pedigree)	Shaded?
Male with genotype TT	PTC taster	Square	No
Male with genotype Tt	1. <u>taster</u>	2. <u>square</u>	3. <u>no</u>
Male with genotype tt	4. <u>non taster</u>	5. <u>square</u>	6. <u>yes</u>
Female with genotype TT	7. <u>taster</u>	8. <u>circle</u>	9. <u>no</u>
Female with genotype Tt	10. <u>taster</u>	11. <u>circle</u>	12. <u>no</u>
Female with genotype tt	13. <u>non taster</u>	14. <u>circle</u>	15. <u>yes</u>

Design an Autosomal Recessive Pedigree!

A couple with the ability to taste PTC have two grown sons and one grown daughter. The sons have the ability to taste PTC. Their daughter is a PTC non-taster. She married a PTC non-taster man, and they have two sons.

Draw a pedigree in the box on the right that fully represents the above scenario and tracks the inability to taste PTC (non-taster), which is caused by two recessive "t" alleles. In your illustrated pedigree, please make sure that:

- (A) generations are listed as Roman numerals and the individuals are numbered.
- (B) the correct shapes for males and females are used.
- (C) the shapes that require shading are shaded.
- (D) the genotypes are listed next to each pedigree shape.



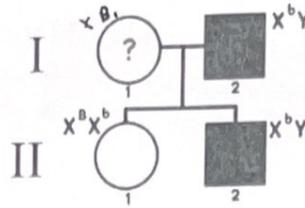
17. What is the phenotype of the sons in generation III? How do you know? tasters / they both had t's because of the parents

Sex-Linked Pedigrees

Sex-linked traits that are tracked in pedigrees are typically on the X chromosome. Assume the following questions refer to colorblindness, which is a sex-linked recessive trait on the X chromosome.

18. Circle the genotype(s) that represent(s) a female with the sex-linked recessive trait.
 $X^B X^B$ $X^B X^b$ $X^b X^b$ $X^B Y$ $X^b Y$
19. Circle the genotype(s) that represent(s) a male with the sex-linked recessive trait.
 $X^B X^B$ $X^B X^b$ $X^b X^b$ $X^B Y$ $X^b Y$





Sam
Jordan

20. View the above sex-linked recessive pedigree. Can you be certain of generation I, individual #1's genotype? Why or why not? Yes/ we know the Pedigrees of the offspring

X^Bx^b

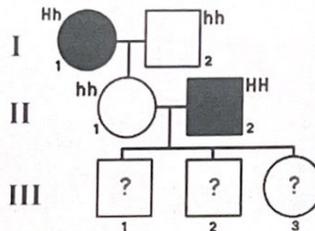
21. All males receive their X chromosome from their mother

22. How are sex-linked pedigrees different from autosomal pedigrees? Attach to sex

Allele

Autosomal Dominant Pedigree

What about tracking an *autosomal dominant* trait, such as having a widow's peak? The presence of one dominant allele for this widow's peak hairline (H) will result in an individual having a widow's peak. Since this pedigree is tracking an autosomal dominant trait, shaded shapes have a widow's peak hairline. *Note: In reality, this trait may be more complex than just a simple gene.



23. How many dominant alleles does an individual need in order to have the autosomal dominant trait? 1

24. Is it possible to know the genotypes of the three children in generation III? Yes
Should their shapes be shaded? Yes Explain your answer to both questions.

from their parents / Both parents have a Big H so all should be shaded

