

Name _____

Period: _____ date: _____

SINGLE GENE TRAITS - Worksheet

PHENYLTHIOCARBAMIDE (PTC) TASTING

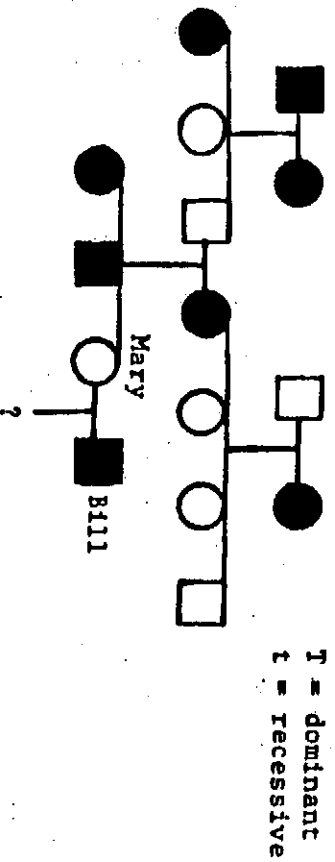
1. Fill in the table for PTC:

| Phenotype | Possible Genotypes |
|-----------|--------------------|
| a. _____ | _____ |
| b. _____ | _____ |

2. Why is the ability to taste PTC considered to be dominant?

3. Which genotype(s) indicate a heterozygote? _____
 a homozygote? _____

4. Fill in all possible genotypes for each person in the Willits family. (Bill is heterozygous.)



a. What possible genotypes could Mary and Bill's children have?

b. Which phenotypes would be possible for their children?

c. What is the probability that their child will be a taster? _____
 a nontaster? _____

Albinism, the absence of pigment, is a recessive trait. People who are albinos are homozygous for the albino gene.

5. Mr. and Mrs. Thomas have two children. Their older son, Mark, has normal pigmentation. Their younger son is an albino. Both Mr. and Mrs. Thomas have normal pigmentation.
 - a. Draw the family pedigree and show all genotypes. Let "A" stand for normal pigment production and "a" represent the albino gene form.
 - b. What are the chances that their next child would be an albino?

What are the chances that this child would have normal pigmentation?
 - c. Would it be possible for Mark to have a child who is an albino? Explain.
6. List any advantages or disadvantages that albinism might have for an individual.
7. Is it possible to determine if a person with a dominant trait is homozygous or heterozygous? Explain.

INGLE GENE TRAITS - WORKSHEET

ongue Rolling

Fill in the table for tongue rolling:

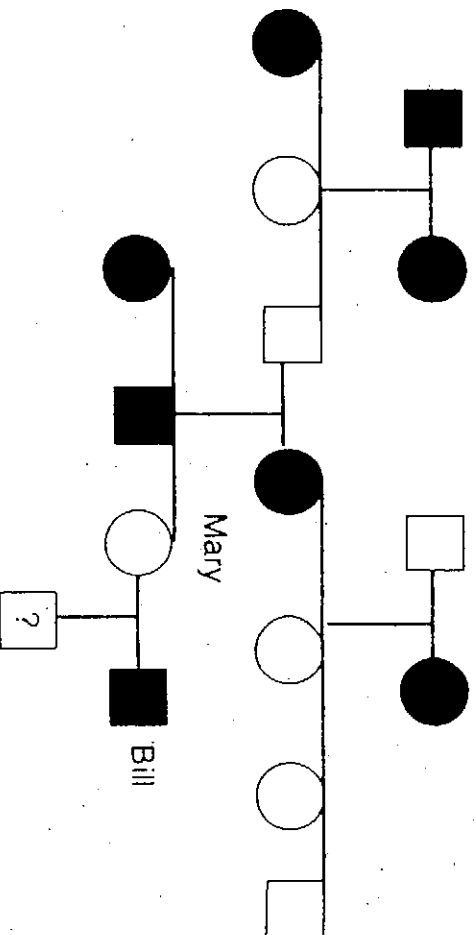
| Possible Phenotype | Possible Genotypes |
|--------------------|--------------------|
| a. | |
| b. | |

Why is the ability to roll the tongue considered a dominant trait?

Which genotype is heterozygous? _____

Which genotypes are homozygous? _____

In all possible genotypes for each person in the Willis family. (Bill is heterozygous.)



What possible genotypes could Mary and Bill's children have?

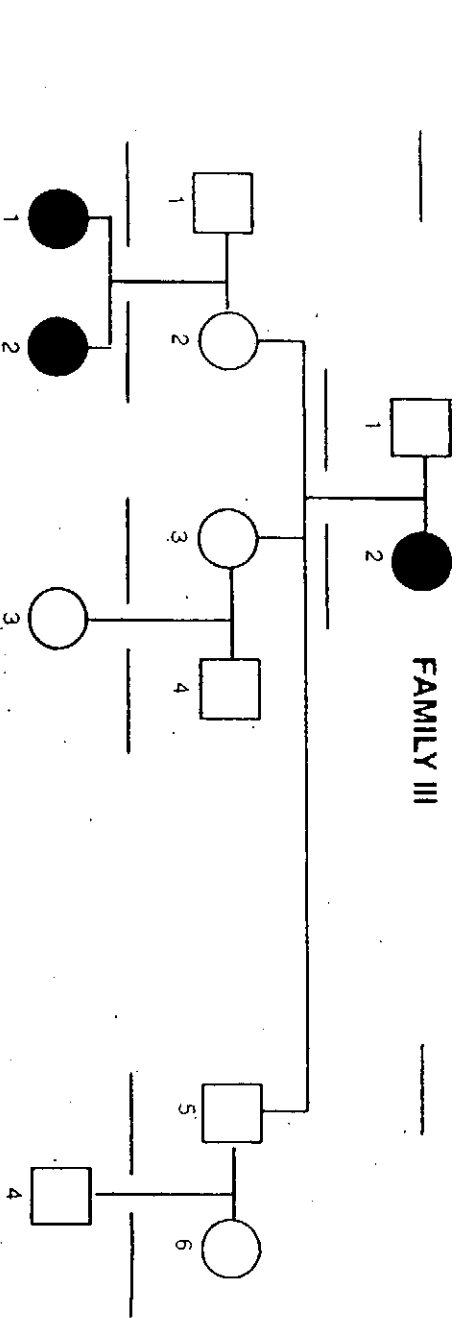
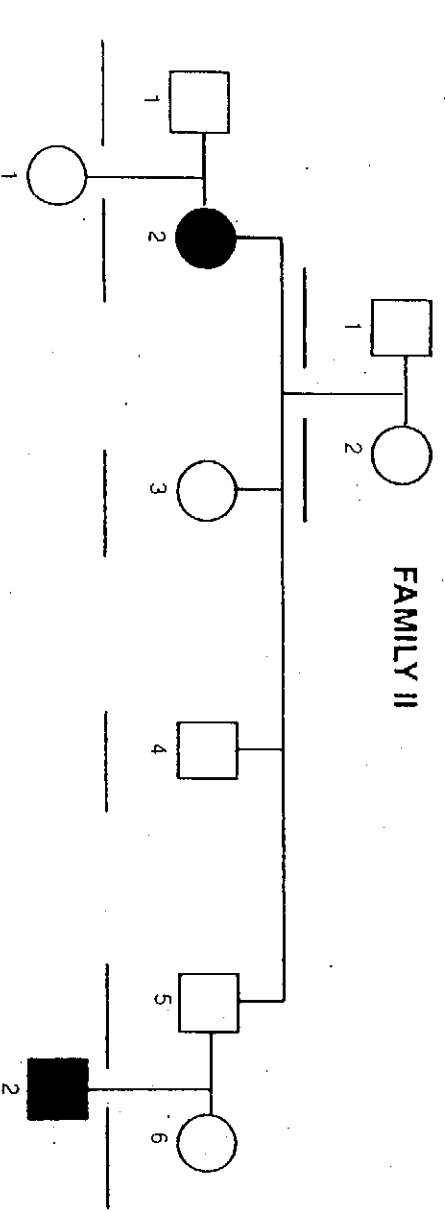
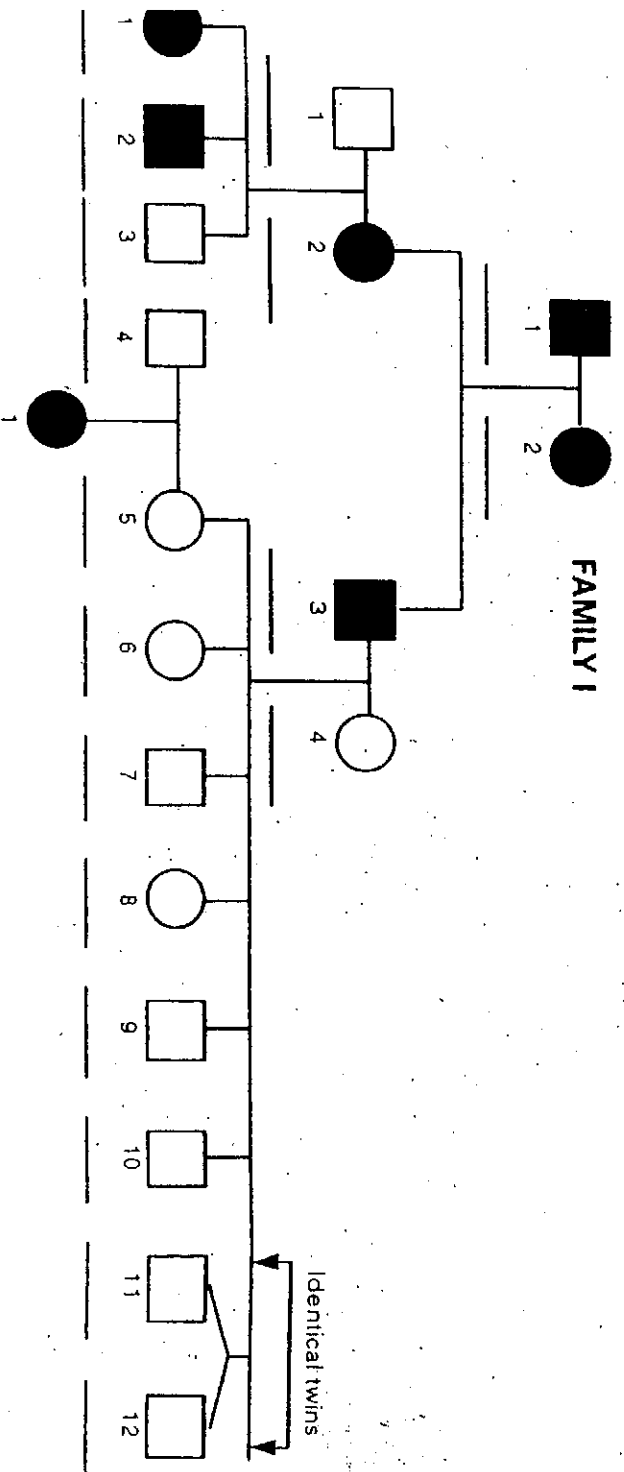
Which phenotypes would be possible for their children?

What is the probability that their child will be a roller?

a nonroller?

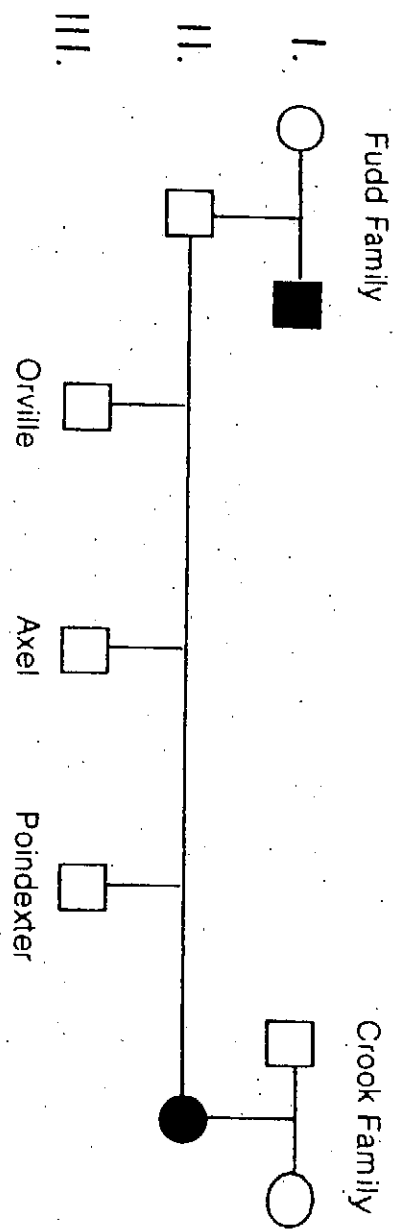
Pedigree Practice

Below are 3 families' pedigrees for earlobe type. The shaded symbols have "attached" earlobes & the unshaded ones have "free" earlobes. Using "F" for free and "f" for attached, identify the genotypes of ALL family members.



PEDIGREE PRACTICE PROBLEMS

- Attached earlobes in humans appears to be controlled by a recessive allele. Using "F" for free and "f" for attached, answer the questions about the family tree. The recessive trait is indicated by the shaded symbol.



- What is the **genotype** of:
 - Father Fudd? _____
 - Grandpa Crook? _____
 - Grandma Crook? _____
 - What is the **phenotype** Grandma Fudd? _____
 - What were Poindexter's chances of having free earlobes? _____
 - What were Axel's chances of having attached earlobes? _____
 - What is Grandma Fudd's chances of being homozygous recessive? _____
 - What was Orville's chances of being homozygous free? _____
- In cattle, the presence of horns is a recessive trait. A hornless bull is crossed with 3 cows.
 - Cow A is horned and produces a hornless calf.
 - Cow B is horned and produces a horned calf.
 - Cow C is hornless and produces a horned calf.



Using "H" to represent the allele for hornless and "h" to represent the allele for horned, make 3 pedigrees to help you determine the genotype of the bull, the 3 cows, and the 3 calves.

- III. The ability to taste a chemical called PTC is a dominant trait.
- If both your parents **cannot** taste PTC, what are your chances of tasting PTC? _____
 - If both your parents **cannot** taste PTC, is it possible that **all 4** of your grandparents could taste PTC? _____

Draw a pedigree of this family

IV. Nearsightedness is thought to be a recessive trait in humans.

Given: **N = normal**
 n = nearsighted

P = Nn **x** **NN**

- What is the phenotype of the father? _____
- What is the phenotype of the mother? _____
- Find the phenotypes, genotypes & list the percents of each of their children.

| | | |
|--|--|--|
| | | |
| | | |

Phenotypic ratio

Genotypic ratio
