

Period: \_\_\_\_\_

Name: \_\_\_\_\_

Date: \_\_\_\_\_

## **GENETICS PRACTICE PROBLEMS I**

If we know the genotype of the parents for a given trait, we can use the Punnett Square to determine the probability of that trait appearing in the offspring. The FOUR STEPS TO SOLVING GENETIC PROBLEMS are shown below. You will use these steps every time to solve genetic problems.

**NOTES:**

- 1) **Complete Dominance:** Dominant traits mask recessive traits.
- 2) **Incomplete Dominance:** Neither dominant or recessive traits are present.

**STEP 1:** Choose letters to represent the genes in the cross (see examples for each step below).

**STEP 2:** Write the genotypes of the parents being crossed.

**STEP 3:** Make a Punnett square.

**STEP 4:** Write the percent probability for each listed genotype and phenotype appearing.

**Directions:** There are four genetic problems below. An example problem has been set-up for you. Copy the Example Problem onto your own paper and fill in the percent probabilities in STEP 4.

**EXAMPLE PROBLEM:**

This is a Complete Dominance problem. A tall purebred female plant is crossed with a tall hybrid male plant. Tall is dominant.

**STEP 1:**

T = Tall  
t = Short

**STEP 2:**

TT x Tt

**STEP 3:**

	T	T
T	TT	TT
t	Tt	Tt

**STEP 4:**

- A. What percent of the offspring will be tall purebred?
- B. What percent of the offspring will be tall hybrid?
- C. What percent of the offspring will be short purebred?
- D. What percent of the offspring will be tall?
- E. What percent of the offspring will be short?

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

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### **PRACTICE PROBLEMS:**

**Directions:** Solve the following genetics problems using the four steps. LABEL EACH STEP.

1) This is a *Complete Dominance* problem. A tall hybrid female plant is crossed with a tall hybrid male plant. Tall is dominant.

**STEP 1:**

**STEP 2:**

**STEP 3:**

**STEP 4:**

- A. What percent of the offspring will be tall purebred? \_\_\_\_\_
  - B. What percent of the offspring will be tall hybrid? \_\_\_\_\_
  - C. What percent of the offspring will be short purebred? \_\_\_\_\_
  - D. What percent of the offspring will be tall? \_\_\_\_\_
  - E. What percent of the offspring will be short? \_\_\_\_\_
- 

2) This is a *Complete Dominance* problem. A hybrid brown eyed female is crossed with a blue eyed male. Brown eyes are dominant over blue eyes.

**STEP 1:**

**STEP 2:**

**STEP 3:**

**STEP 4:**

- A. What percent of the offspring will likely have brown eyes? \_\_\_\_\_
- B. What percent of the offspring will have blue eyes? \_\_\_\_\_
- C. What percent of the offspring will be purebred brown eyes? \_\_\_\_\_
- D. What percent of the offspring will be hybrid brown eyes? \_\_\_\_\_
- E. What percent of the offspring will be purebred blue eyes? \_\_\_\_\_

Period: \_\_\_\_\_

Name: \_\_\_\_\_

Date: \_\_\_\_\_

3) This is an *Incomplete Dominance* problem.. A red purebred 4 O'clock flower is crossed with a white purebred flower

**STEP 1:**

**STEP 2:**

**STEP 3:**

**STEP 4:**

- A. What percent of the offspring will be red? \_\_\_\_\_
  - B. What percent of the offspring will be white? \_\_\_\_\_
  - C. What percent of the offspring will be pink? \_\_\_\_\_
  - D. What percent of the offspring will be purebred red? \_\_\_\_\_
  - E. What percent of the offspring will be purebred white? \_\_\_\_\_
  - F. What percent of the offspring will be hybrid pink flowers? \_\_\_\_\_
- 

4) This is an *Incomplete Dominance* problem.. A black purebred mouse is crossed with a gray hybrid mouse

**STEP 1:**

**STEP 2:**

**STEP 3:**

**STEP 4:**

- A. What percent of the offspring will be black? \_\_\_\_\_
- B. What percent of the offspring will be white? \_\_\_\_\_
- C. What percent of the offspring will be gray? \_\_\_\_\_
- D. What percent of the offspring will be purebred black? \_\_\_\_\_
- E. What percent of the offspring will be purebred gray? \_\_\_\_\_
- F. What percent of the offspring will be hybrid? \_\_\_\_\_