Mendel's other law

Mendel took true breeding strains with two different traits each (P cross) :

    White Flowers/Round Peas (ff RR) X (FF rr) Purple Flowers/Wrinkled Peas
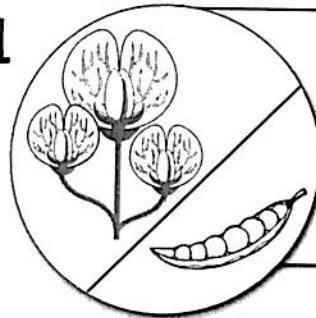
All their F1 offspring had _____ and _____ (Ff Rr).

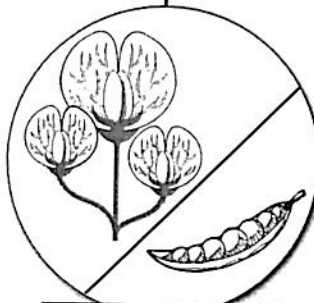   Then, he crossed two of the F1 offspring

F1

Phenotype: _____

Genotype: _____
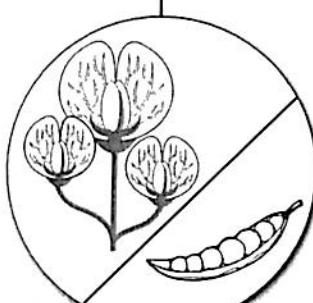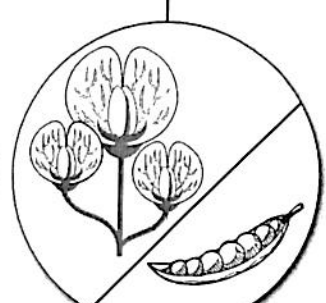

X

Phenotype: _____

Genotype: _____

F2

Purple Flowers Round Peas	Purple Flowers Wrinkled Peas	White Flowers Round Peas	White Flowers Wrinkled Peas

To fill in the fraction of offspring for each genotype, fill in the large Punnett square on the next page.

Law of Independent Assortment

Mendel found that each of the alleles were inherited_____. Inheriting a round pea allele did not mean also inheriting a white flower allele.

Things Mendel didn't know:

All the traits he was studying were _____ genes, on separate chromosomes in the pea plant.

Name: _____

Law of Independent Assortment

1 Which traits/alleles are dominant?

_____

Which traits/alleles are recessive?

_____

How to figure out the gametes:
Write every combination with an allele
from each gene.

2   Parent #1: **X** Parent #2:

Phenotype: _____   _____

Genotype: _____   _____

Gametes: _____   _____

3

4

5 The Genotype Ratio is rarely used in Dihybrid Problems.

6 Phenotype Ratio:

_____ : _____ : _____ : _____

Example: Dihybrid Cross

A scientist crosses two pea plants that are heterozygous for plant height and flower color. Tall is dominant over short and purple is dominant over white. The plant height and flower color genes are unlinked. Complete the information below and the Punnett square. Then answer the questions below.
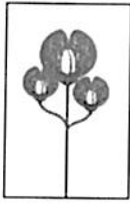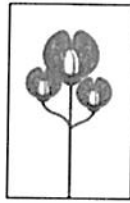
tall, purple flowered pea plant   X   tall, purple flowered pea plant

1. Phenotype: _____
2. Genotype: _____
3. Gametes: _____

4. Phenotype: _____
5. Genotype: _____
6. Gametes: _____

7. Punnett Square:

tall purple flower plant's gametes (top)

tall purple flower plant's gametes (left)

8. What is the phenotype ratio of their progeny? _____

9. What fraction of the offspring plants will be short and have purple flowers? _____

There is another way we can answer question #9 above: Probability!

There's another way to get the right answer to question 9: use probability!

_____

10. Just think about the plant height gene right now. When two heterozygous tall plants are crossed, what fraction of their offspring are short?

_____

11. Now only consider the flower color gene. When two heterozygous purple plants are crossed, what fraction of their offspring have purple flowers?

_____

12. To find the fraction of offspring that have BOTH purple flowers and short height, multiple your answers from #10 and #11.

_____

Your answer to #12 should match your answer to #9. You now know an easier way to solve dihybrid problems without filling out a giant square.