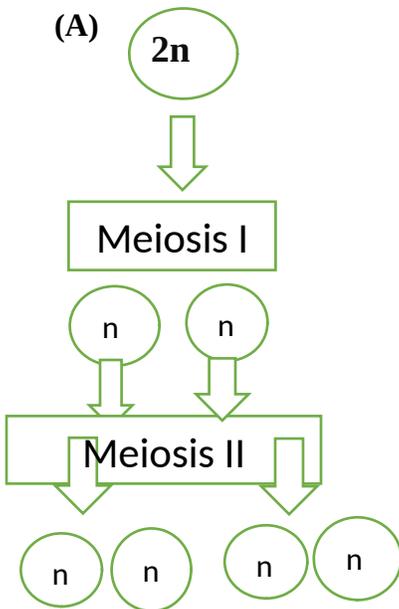


# BIO 137 WS 4: Understanding Genetics Work sheet

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In the diagram below (A) a diploid cell with  $2n$  chromosomes is undergoing meiosis. Fill in the diagram by writing the letters  $n$  or  $2n$  in the cells (circles) to indicate whether the cells are haploid or diploid (7 pts)



Use the following information for questions 3-6: (8 pts)

In dogs, the gene for fur color has two alleles. The **dominant allele (F)** codes for **grey fur** and the **recessive allele (f)** codes for **black fur**. The **female dog is heterozygous**. The **male dog is homozygous recessive**.

- What is the genotype of the female dog? Ff
- What is the phenotype of the female dog? Grey Fur
- What is the genotype of the male dog? ff
- What is the phenotype of the male dog? Black fur
- Fill out the Punnett square to determine the phenotypes and genotypes of their possible puppies. (8 pts)

Genotype (6 pts)

- What percentage of the puppies are homozygous grey (FF)? 0%
- What percentage of the puppies are homozygous black (ff)? 50%
- What percentage of the puppies are heterozygous grey (Ff)? 50%

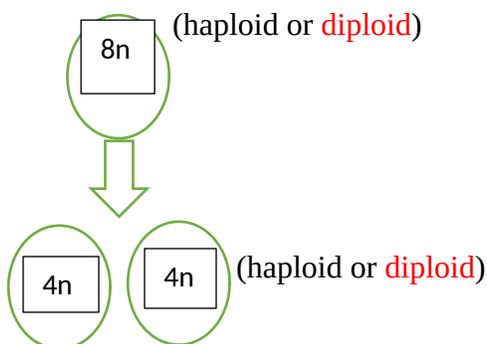
Phenotype (4 pts)

- What percentage of the puppies are grey? 50%
- What percentage of the puppies are black? 50%

Ff	Ff
ff	ff

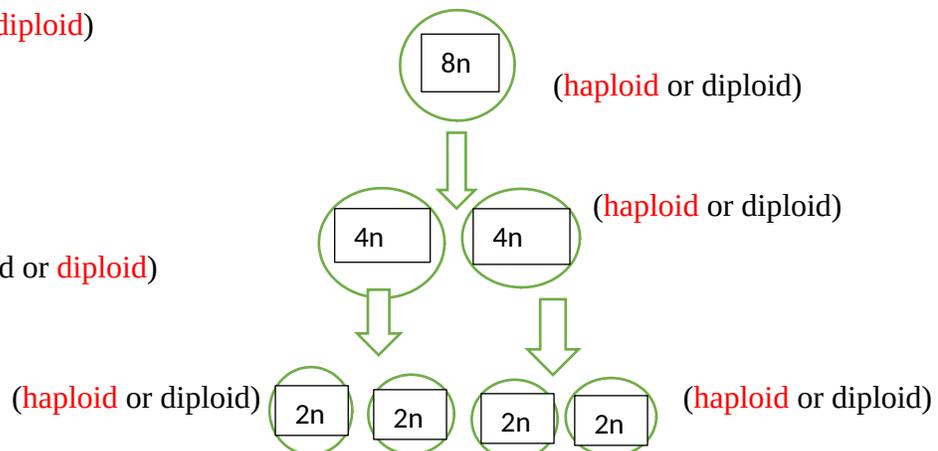
- The flight muscle cells of a fruit fly have 8 chromosomes. Fill in the correct chromosome number in each of the the following cells undergoing cell division. Then circle haploid or diploid appropriately.

**CELL A (5 pts)**  
MITOSIS



**CELL B (11 pts)**

MEIOSIS



Use the following information for questions 13 -18

In dogs, there is an hereditary deafness caused by a recessive gene, "d." A kennel owner has a male dog (Gilbert) that she wants to use for breeding purposes if possible. The dog can hear.

13. What are the two possible genotypes of Gilbert? (1) DD and (2) Dd (4 pts)

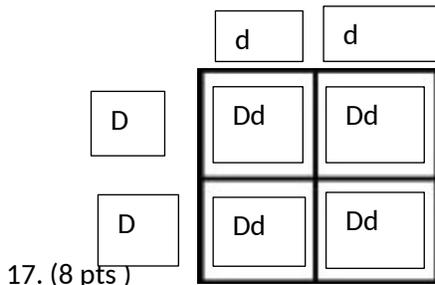
If Gilbert's genotype is Dd, the owner does not wish to use him for breeding so that the deafness gene will not be passed on. This can be tested by breeding Gilbert to a deaf female dog named Susie.

14. What is the possible genotype of Susie.? dd (2 pts)

Fill out two Punnett squares to illustrate these two possible crosses. Use two possible Genotypes of Gilbert and one possible genotype of Susie.

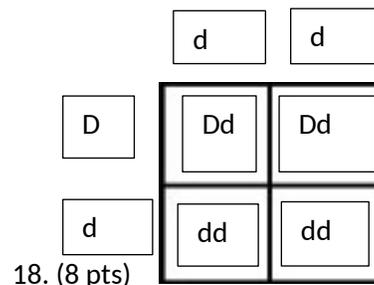
15. Gilbert's genotype (1) DD (1 pt)

Susie's genotype dd (1 pt)



16. Gilbert's genotype (2) Dd (1pt)

Susie's genotype dd (1pt)



19. 100 % can hear (2 pts)

21. 50 % can hear (2 pts)

20. 0 % **cannot** hear (2 pts)

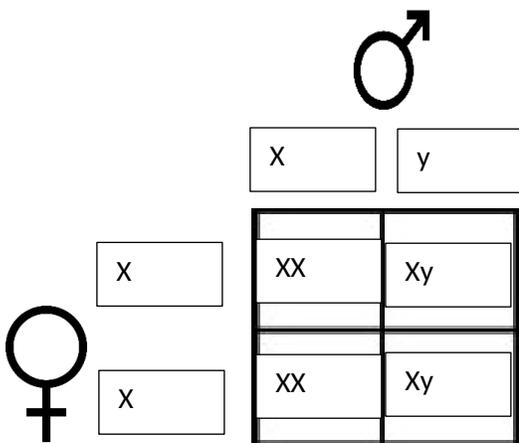
22. 50 % **cannot** hear (2 pts)

A human couple wants to have a biological baby. Provide the following information first.

23.  23(Xy) male sex chromosomes (2 pts)

24.  23(XX) female sex chromosomes(2pts)

25. Fill in a Punnett square using the sex chromosomes of the parents. (8pts)



26. 50 % boy baby (2pts)

27. 50 % girl baby (2pts)

8. Who determines the gender of the baby? (1 pt) **Circle all that applies.** A. **Father** B. Mother C. Both

