**Biology Genetics Set #1 Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

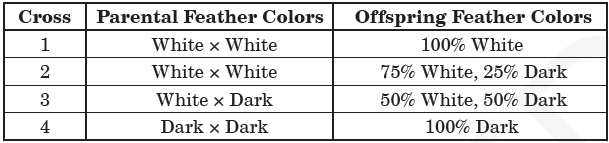
1. Hitchhiker’s Thumb (H) is dominant to no hitchhiker’s thumb(h). A woman who does not have hitchhiker’s thumb is married to a man who is heterozygous for hitchhiker’s thumb. What is the probably genotypic ratio of their children?

H H

H HH HH

h Hh Hh

1. Can the following set of parents have a child with Type O blood? Show your cross to support your answer.
   1. Type AB x Type B No
   2. Type AB x Type O No
   3. Heterozygous Type A x Type O Yes
   4. Homozygous Type A x Type O No
2. The chart shows several crosses with white-feathered chickens and dark-feathered chickens.



Which cross would represent the cross Aa x aa, where (A) is the dominant and (a) is the recessive allele? **SHOW YOUR CROSS TO SUPPORT YOUR ANSWER. #3**

**A a**

**A AA Aa**

**A AA Aa**

**Incomplete Dominance vs. Codominance**  
4. A mating between a black goose and a white goose produces blue-gray offspring. (Blue-gray is an ***intermediate*** color between black and white.) Is this an example of incomplete dominance or codominance?\_\_\_\_\_\_\_\_\_\_\_Incomplete produces a new color\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
  
 Fill in the phenotypes below for the geese in problem **4**.

B B = black  
BB’=\_\_\_blue-gray\_\_\_\_\_\_\_\_\_  
B'B'=\_\_white\_\_\_

5. Make a Punnett square showing a cross between a black goose and a blue-gray goose. What percentage of offspring would be black?

|  |  |
| --- | --- |
| BB | BB |
| BB**’** | BB**’** |

B B

Answer:\_\_\_50%\_\_\_\_\_\_\_% Bbbb

B

B**’**

B

6. A reddish/brown-haired cow when crossed with a white-haired cow produces offspring that have reddish/brown hairs AND white hairs (This color is called roan). Is this an example of incomplete dominance or codominance? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Fill in the missing genotype and phenotype below for problem **6**.

RR = Reddish/Brown

\_\_\_=Roan

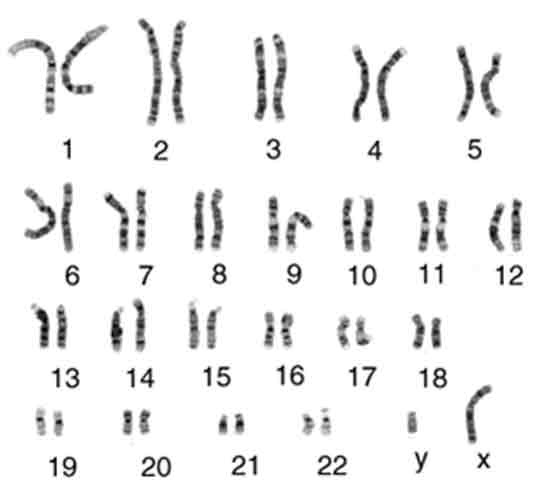
WW = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

7. Make a Punnett square that shows the cross described in #**6**. What percentage of the offspring will be heterozygous?

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

Answer: \_\_\_\_\_\_\_\_\_\_%

**Karyotypes**

8. There are \_\_\_\_\_\_\_\_\_ chromosomes in a human somatic cell.

9. A male has \_\_\_\_\_\_\_\_\_ chromosomes for the 23rd pair and a female has \_\_\_\_\_\_\_\_\_ chromosomes for the 23rd pair.

10. A person with down syndrome has an extra chromosome in the \_\_\_\_\_\_\_\_\_\_\_ chromosome pair.

11. A person with Klinefelter’s syndrome can be recognized by an \_\_\_\_\_\_\_\_\_.

12. Both down syndrome and Klinefelter’s syndrome are a form of \_\_\_\_\_\_\_\_\_\_\_\_\_\_because they have an abnormal number of chromosomes.

13. A person with Turner’s Syndrome can be recognized as missing which chromosome? \_\_\_\_\_\_\_\_\_\_ They are considered a \_\_\_\_\_\_\_\_\_\_\_\_\_ because they only have one chromosome 23.

**Review of Mitosis and Meiosis**

Which diagram is which? Fill in the FINAL chromosome #’s.

Meiosis, Haploid, 15 chromosomes

30

30

Mitosis, Diploid, 30 chromosomes

Complete the following chart comparing mitosis and meiosis

|  |  |  |
| --- | --- | --- |
| Characteristic | MITOSIS | MEIOSIS |
| Location(s) where process occurs | All cells except sex cells | Ovaries/Testicals |
| number of cells produced | 2 | 4 |
| chromosome number of parent nucleus (haploid/diploid) | Diploid 2n | Diploid n |
| chromosome number of new nucleus | Diploid 2n | Haploid n |
| type of cell produced  (body cell/gamete) | Body cells (somatic cells) | gametes |
| function in the organism | Growth & repair | Formation of gametes |

1. If a Cow sperm cell contains 30 chromosomes, how many chromosomes are in a cow heart cell?

* 1. 30 b. 60 c. 90 d. 120

2. If you fall and scraped your knee while walking to the bus stop, what process will repair your wound?

a. Osmosis b. Mitosis c. respiration d. Meiosis

3. Which of the following represents the predicted product of *Meiosis* in a *human cell*?

a. Two cells with 46 chromosomes

* 1. Eight cells with 23 pairs of chromosomes
  2. Four cells with 23 chromosomes

d. Three cells with 23 chromosomes

4. Which division produces haploid cells that are genetically recombinant due to *crossing over* and *independent assortment*? Circle: Mitosis or Meiosis