

## Chromosome and Karyotype Review

Somatic cells always have an even number of chromosomes because they exist in pairs ( $2n$  or diploid). One unique set is found in a father's sperm ( $n$  or haploid) and one unique complementary set is found in a mother's egg ( $n$  or haploid). Egg and sperm fuse together during fertilization ( $n + n$ ) to create a zygote. This zygote, or fertilized egg contains 2 sets of chromosomes ( $n + n = 2n$ , which is diploid and the total chromosome #).

Chromosome Numbers: "n" is used to represent the number of different chromosomes.

Example: In our somatic cells ( $2n$ ), there are 23 pairs of chromosomes, or  $2n = 46$ .  
In our eggs or sperm, we have 23 unique single chromosomes, or  $n=23$ .

1. Complete the following table of chromosome number in various species:

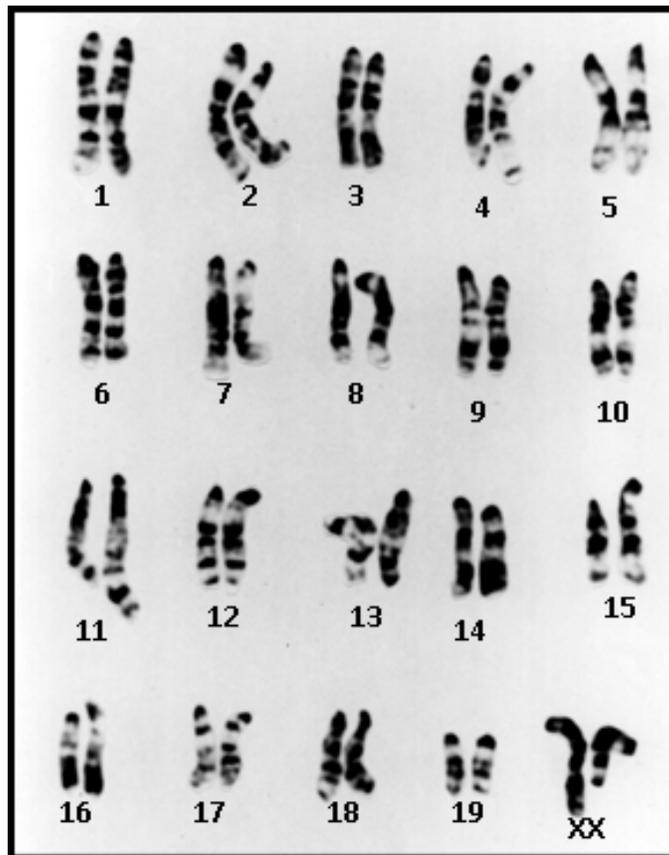
<i>Species</i>	<i>Chromosome # in somatic cells (<math>2n</math>)</i>	<i># of homologous chromosome PAIRS</i>	<i>Chromosome # in gametes (<math>n</math>) (NO PAIRS)</i>
<i>Human</i>	$2n = 46$	23 pairs of chromosomes	$n = 23$
<i>Fruit fly</i>	$2n = 8$		
<i>Leopard frog</i>	$2n = 26$		
<i>House fly</i>			$n = 6$
<i>Chimpanzee</i>			$n = 24$
<i>Bat</i>		22 pairs	
<i>Chicken</i>		39 pairs	
<i>King crab</i>		104 pairs	
<i>Camel</i>	$2n = 70$		
<i>Goat</i>			$n = 30$
<i>Armadillo</i>			$n = 32$
<i>Petunia</i>		7 pairs	
<i>Rice</i>	$2n = 24$		

Now answer similar questions reading carefully whether gamete number, chromosome pairs, or chromosome number is asked for. Answer with either  $2n = ?$  or  $n = ?$

- Dogs have 78 chromosomes in their somatic cells. How many are in their gametes? \_\_\_\_\_
- How many pairs of chromosomes do dogs have in their somatic cells? \_\_\_\_\_
- Cats have 38 chromosomes in their somatic cells. How many chromosomes are in their gametes? \_\_\_\_\_

# Karyotype Analysis

Directions: Answer the following questions using the karyotype below.



5. Look at the following Karyotype; is this organism male or female? \_\_\_\_\_
6. How many chromosomes are found in the somatic cells of this organism? \_\_\_\_\_
7. How many chromosomes are found in sperm cells from this organism? \_\_\_\_\_
8. How many pairs of chromosomes does this organism's karyotype contain? \_\_\_\_\_
9. How many chromosomes would be found in this organism's skin cells? \_\_\_\_\_
10. How many chromosomes would be found in this organism's egg cells? \_\_\_\_\_

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11. Mr. and Mrs. Simpson (human couple) are having a little girl, but the doctor found something abnormal in the karyotype: Chromosome pair 23, only showed one X. Write the notation for this karyotype.

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