Biology

Karyotype

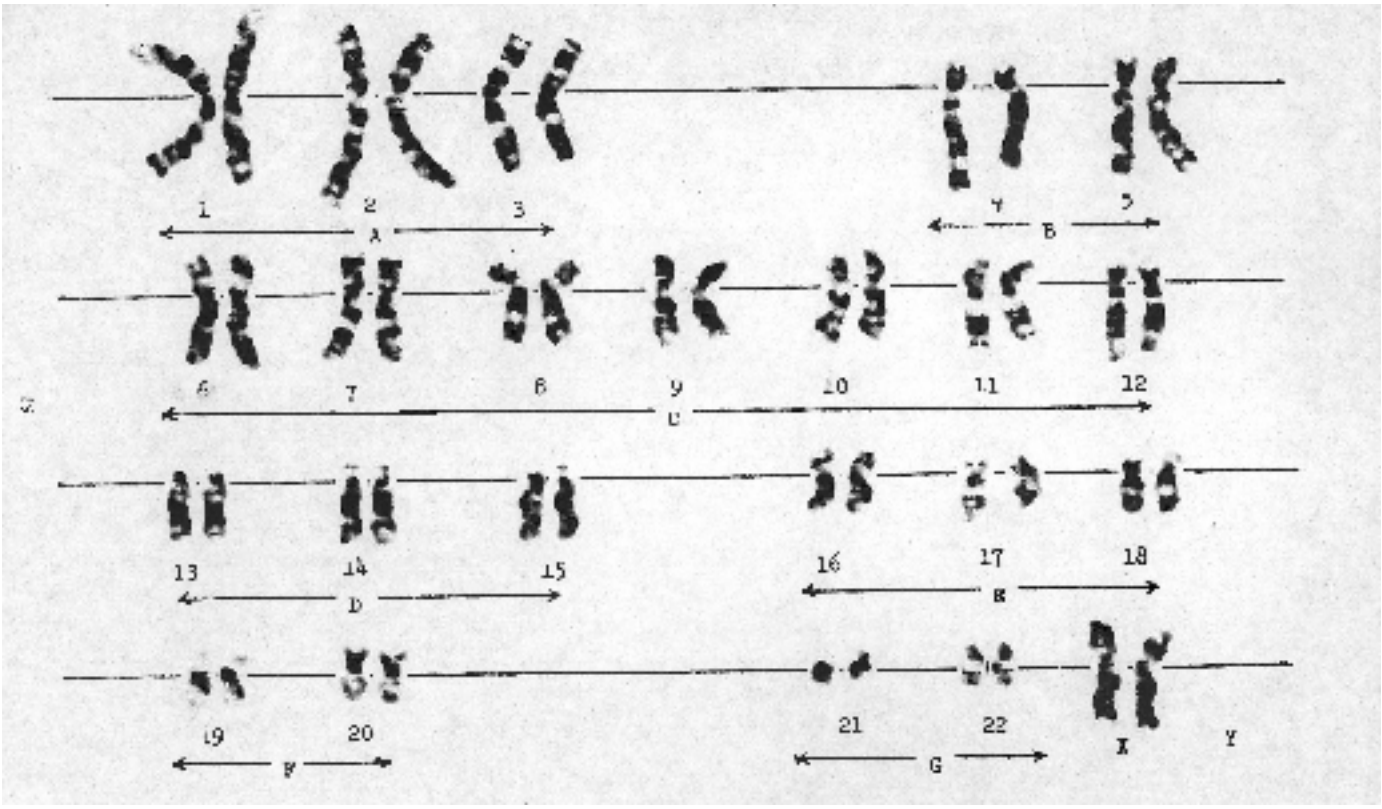
Worksheet

Name_____ Period_____ Date_____

Using the following diagrams please answer the corresponding questions

The following diagram is of a set of human chromosomes. This diagram is known as a ***KARYOTYPE***. There are several things that can be seen in such a diagram. You will discover these things through the following **readings** and **questions**.

Karyotype A



1.) **Karyotype A** is the first set of chromosomes we will look at. Notice that the chromosomes are all paired up. **How many pairs of chromosomes do you see?** _____

2.) Looking closer you will see that the pairs of chromosomes are paired according certain likeness among the chromosomes. **List some likenesses that you see among paired chromosomes:**

3.) Each karyotype chart also shows some important details about the sex of the organism. **Looking at this particular karyotype chart what is the sex of the organism?** _____

4.) The chromosomes in the karyotype also show some light and dark bands. **What do you think these "regions" of light and dark bands are?**

5.) If you start with chromosome number 1 and go until chromosome number 22 you will see a trend in size correlation. **What is this trend?**

6.) **How do you think this trend affects the number of genes present on any particular chromosome?**

7.) Each of the pairs of chromosomes are numbered. **How many pairs of *NUMBERED* chromosomes do you see?**
_____

8.) What are these ***NUMBERED*** pairs of chromosomes called?

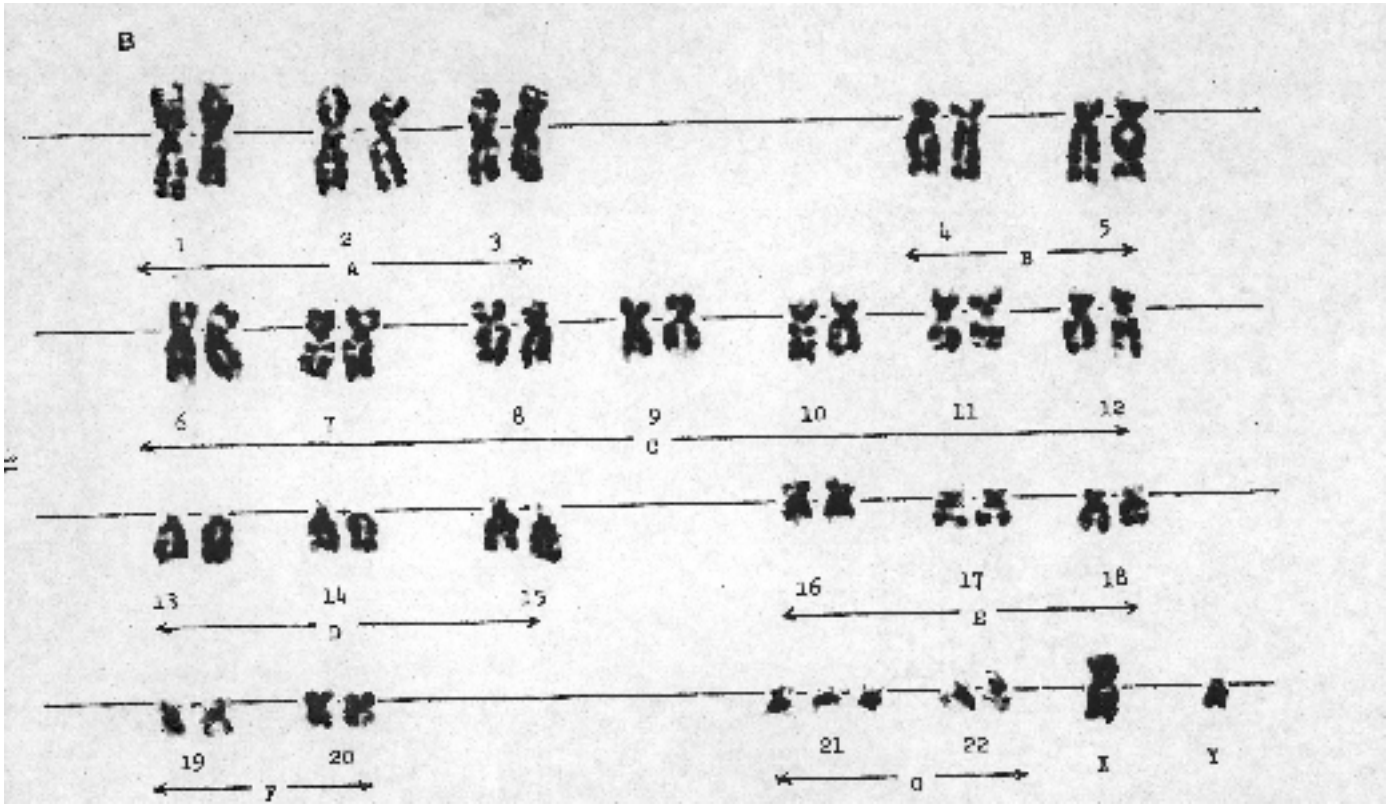
9.) There is a final set of paired chromosomes, these are called **SEX CHROMOSOMES**. What are the **POSSIBILITIES** for sex chromosomes? _____ and _____

10.) You will notice that the pairs of chromosomes are categorized in groups. These groups are lettered A---->G. Can you see any reason or trends in the categorization of the chromosomes? If so, what is the trend?

11.) Every karyotype is specially named. This naming system is based on three things. One, the number of chromosomes (example: 46). Two, the sex of the organism (example: XX). And, three, any extra chromosomes that would cause a genetic defect (example: +18). What do you expect the name of this particular karyotype to be?

_____ _____ _____

Karyotype B



1.) How many pairs of autosomes does this karyotype have? _____

2.) How many pairs of sex chromosomes does this karyotype have? _____

3.) What do you notice about the X and Y chromosomes?

4.) What is the sex of this organism? _____

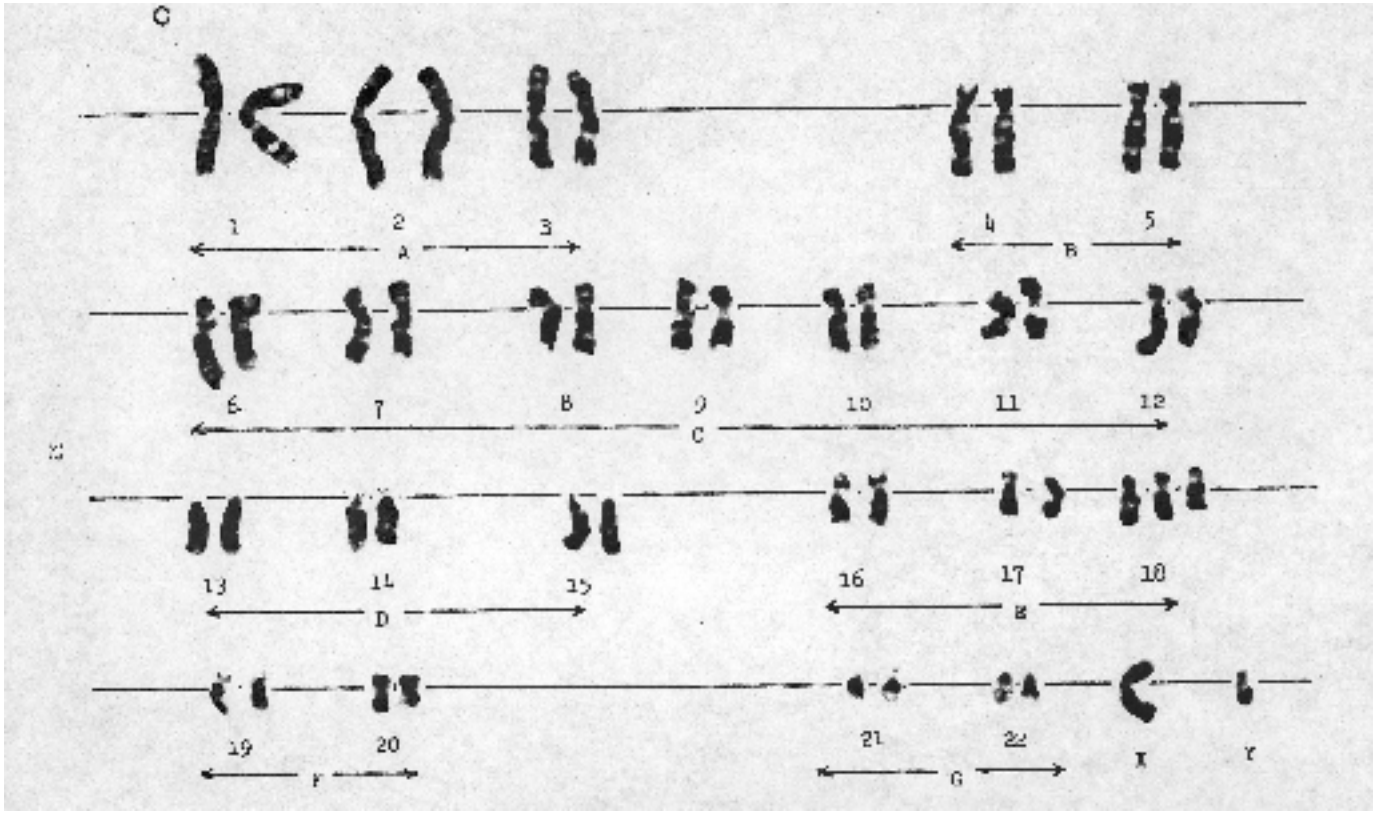
5.) If you look closely at the chromosomes in karyotype B versus karyotype A you see a ***HUGE*** difference. Can you tell what the difference is? Explain why this phenomenon exists? (Hint: what happens in Prophase I)

6.) Looking at ALL of the pairs do you see any strange circumstances? What is the special circumstance that you find?

7.) What kind of effect do you think this abnormality on chromosome pair #21 will have on the organism?

8.) What will you name this karyotype? _____ _____ _____

Karyotype C



1.) Had these chromosomes undergone *replication* before they were separated ? _____

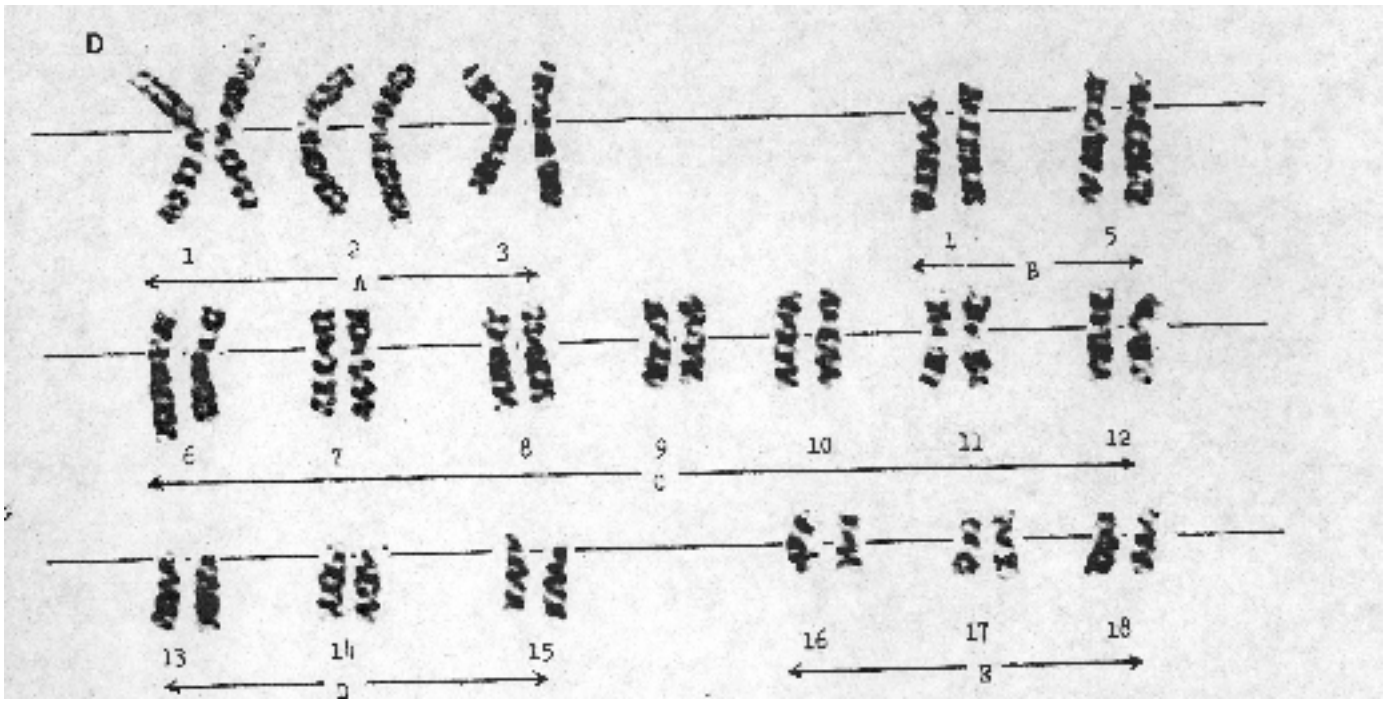
2.) What is the sex of this organism? _____

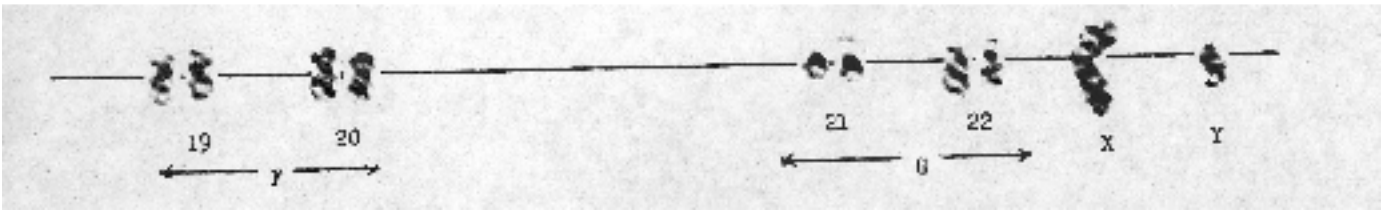
3.) Are there any *TRISOMY'S* (three chromosomes instead of a pair) in this karyotype? _____
If so, which chromosome pair is a trisomy? _____

4.) Name this karyotype? _____ _____ _____

5.) What would you expect to see in the *number of genes* on chromosome 18?

Karyotype D





1.) What is the sex of this organism? _____

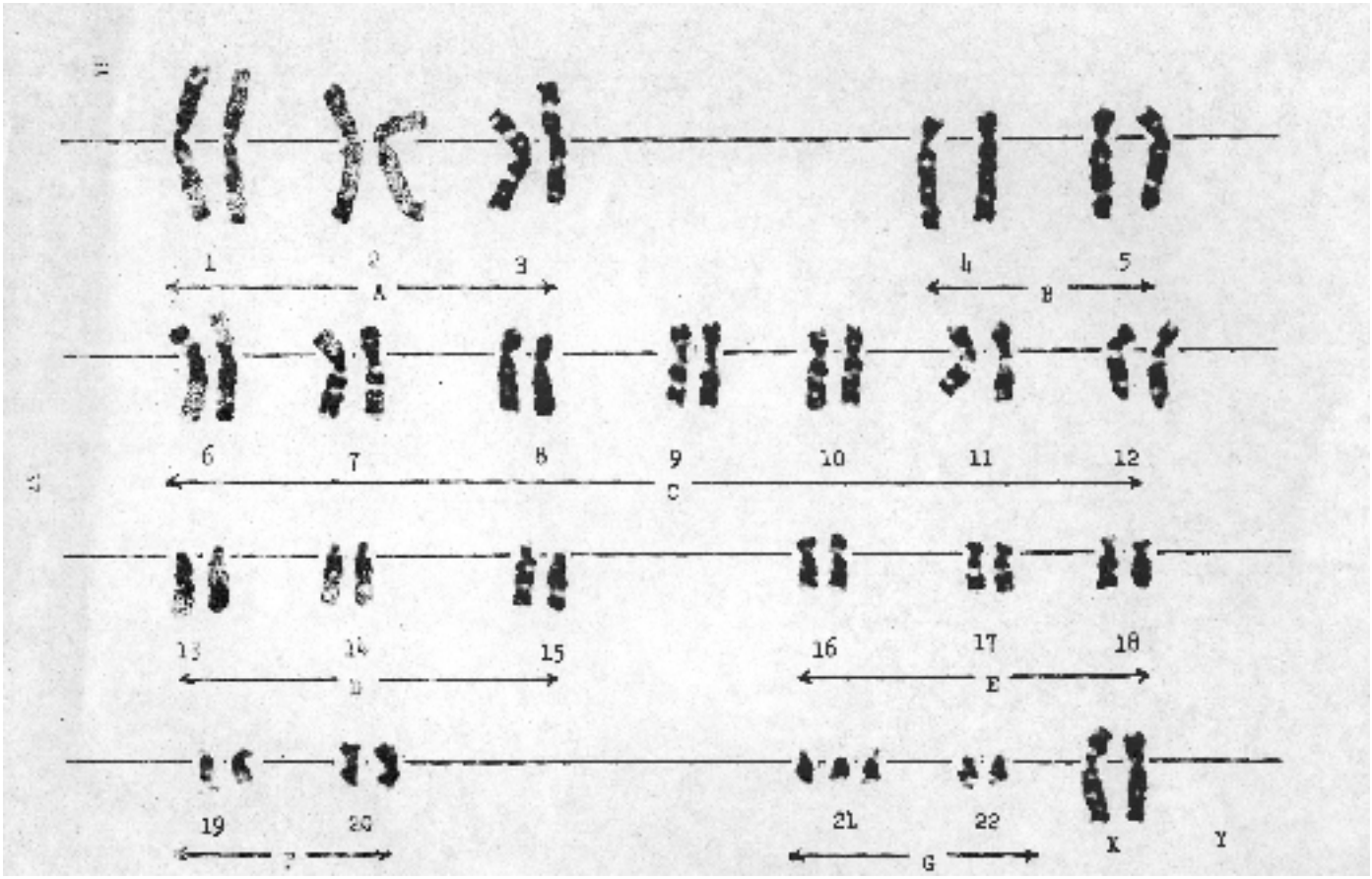
2.) Had these chromosomes undergone *replication* before they were separated ? _____

3.) Are there any trisomy's or other abnormalities in this organism? _____

4.) Would you expect to see a normal or abnormal organism in karyotype D? _____

5.) Name this karyotype? _____ _____ _____

Karyotype E



1.) What is the sex of this organism? _____

2.) Had these chromosomes undergone *replication* before they were separated ? _____

3.) Are there any trisomy's or other abnormalities in this organism? _____
If so, where? _____

4.) Would you expect to see a normal or abnormal organism in karyotype E? _____

5.) Name this karyotype? _____ _____ _____