Karyotyping

<http://www.biologycorner.com/worksheets/karyotyping.html>

In this activity, you will use a computer model to look at chromosomes and prepare a karyotype. You will diagnose patients for abnormalities and learn the correct notation for characterizing karyotypes.

## Site 1: www.biology.arizona.edu

Click on Karyotyping under human biology and read the Introduction page:
1. What causes a dark band on the chromosome? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. What is a centromere? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Patient Histories: \*Click on Patient Histories. You will be completing a karyotype for Patient A, B & C

#### Patient A ( Click on the link to "Complete Patient A's Karyotype" )

\*Match the chromosome to its homolog. After all the matches are complete you'll analyze your patient. (Scroll down to view your completed karyotype).

3. What is patient A's history (summarize) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. How many total chromosomes are in your karyotype - count them \_\_\_\_\_\_\_\_\_
The last set of chromosomes is the sex chromosomes, if you have two large chromosomes, your patient is XX (female), one large and one small indicates and XY (male) . What sex chromosomes does your patient have \_\_\_\_\_\_\_\_
Which chromosome set has an extra + \_\_\_\_\_\_\_
5. What diagnosis would you give this patient (what disease)? \_\_\_\_\_\_\_\_\_\_\_\_\_\_

#### Patient B - click on the link to go to Patient B and repeat the above process.

6. What is Patient B's history (summarize) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
7. How many total chromosomes are in your karyotype - count them \_\_\_\_\_\_\_\_\_
What sex chromosomes does your patient have \_\_\_\_\_\_\_\_
Which chromosome set has an extra + \_\_\_\_\_\_\_
8. Finish the notation for this patient's karyotype : 47 X \_\_\_\_\_
9. What is the diagnosis? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

#### Patient C - click on the link to go to Patient C and repeat the above process.

10. What is patient C's history (summarize)? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
11. How many total chromosomes are in your karyotype - count them \_\_\_\_\_\_\_\_\_
What sex chromosomes does your patient have \_\_\_\_\_\_\_\_
Which chromosome set has an extra + \_\_\_\_\_\_\_
12. Write out the correct notation for this karyotype. \_\_\_\_\_\_\_\_
13. What is the diagnosis? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

## Site 2: Genetic Science Learning Center ( <http://learn.genetics.utah.edu/> )

Go to "heredity and traits" --> "How Do Scientists Read Chromosomes"
(Find the answers to the following questions in this area. Browse all sections)

1. What are the three key features used to read chromosomes?
\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2. Sketch or describe: metacentric, submetacentric, acrocentric

3. Got to Make a Karyotype - Try it yourself - Create your own karyotype - turning on hints is okay.
Check this box when your karyotype is complete
What did you find difficult about matching the chromosomes? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

4. Go to -Using Karyotypes to Predict Genetic Disorders
What is trisomy? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
What is monosomy? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
What is a terminal deletion? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

5. For each of the Disorders, describe the chromosome abnormality and the symptoms. (Type each into the search box at learn.genetics)

Cri Du Chat

Turner Syndrome

Klinefelter Syndrome

Williams Syndrome

## Extra Credit - http://bluehawk.monmouth.edu/~bio/karyotypes.htm

Pick from the list of abnormal karyotypes and arrange the chromosomes in a karyotype. Use the "print screen" button to copy your finished karyotype onto a word processing document. For "Diagnosis" write the chromosome set that has the abnormality, and what type of abnormality it is. Print this page out and turn it in.