

# Biology

## Core Activity

<p><b>Standard # 3520-04</b>Students will evaluate the significance and impact of genetic alteration on living organisms.</p> <p><b>Objective # 3520-0402</b>Describe how mutations affect genes and genetic expression.</p> <p><b>ILOs:</b>Use basic science process skills by making observations, categorizing information, using reference materials and making estimations based on current knowledge. Manifest scientific attitudes and interests by demonstrating curiosity and by reading scientific literature in order to gain greater understanding.</p>	<p><b>Topic:</b> Heredity</p> <p>3520-04</p>
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### Description of Activity

*Activity Title:* What's wrong here?

*Activity Overview/Duration:* The students will observe a karyotype of an unknown genetic disorder and spend two days in associated research.

*Materials:* Provide copies of various karyotypes, scissors, glue sticks, paper, rulers, tape, reference materials including visual references such as posters and any other materials or equipment students might need.

### Background Information

Students should be familiar with cells, chromosomes, chromosome numbers, mitosis, meiosis and related concepts.

If you personally have little background experience with karyotyping and the literature available, begin with a good college human genetics text for your own study and for ideas for student materials. Some companies such as Carolina Biological Supply also produce materials that can be used or adapted for use in this type of activity.

### Teaching and Learning Strategies

Don't tell them too much - ensure the inquiry experience. (i.e., if possible, let students discover the karyotyping process on their own. Don't necessarily tell them how to pair chromosomes. This is largely a research activity but students can still feel a great measure of discovery if you offer

only as much direction as is absolutely necessary. The direction you give individuals may vary greatly.)

Make sure students are aware of the materials available for their use.

It is recommended that students work in pairs during this exercise.

### **Development of Laboratory Skills and Tools**

The skills required for this exercise are quite elementary.

Remind students to be careful with sharp objects.

Students will most likely cut, paste, identify and research their assigned karyotype.

### **Invitation to Learn**

Provide students with a karyotype and state, "Here's what makes this person. What's wrong here? Why?"

### **Summary of Learning**

1. What made you group the striped Xs together the way you did?
2. What do you think the Xs did to this individual?
3. (Note for the teacher: This question assumes some pre-teaching of critical terms.) If your karyotype contained an odd number of chromosomes what caused this?
  - A. Crossing over
  - B. Nondisjunction
  - C. Gene linkage
  - D. Point mutation
4. What is the normal diploid number of chromosomes in a human?
  - A. 48
  - B. 92
  - C. 23
  - D. 46