

Ready-To-Go Lessons With BioEd Online

Title

X or Y – Does it Make a Difference?

Objective/Proficiencies

Students will describe functional differences of X and Y chromosomes.

Students will explain the significance of differences in X and Y chromosomes in the human genome.

National Education Science Standards

The Cell:

Cells store and use information to guide their functions.

Cell functions are regulated through selective expression of individual genes.

Molecular Basis of Heredity:

Instructions for specifying the characteristics of the organism are carried in DNA.

There is a pair of chromosomes that determines sex.

Audience/Time

Grades 9 - 12

55-minute class period

Materials/Preparation

1. Locate each of the following four articles.

“Researchers Unravel Secrets of X Chromosome.” April 2005, *From the BCM Labs (BioEd Online)*

“Y Chromosome Reveals Hidden Sequence.” January 9, 2005, *Nature Update (BioEd Online)*

“Women Get Extra Dose of X Chromosome Genes.” March 16, 2005, *Nature Update (BioEd Online)*

“Studies Expand Understanding of X Chromosome.” March 16, 2005, *NIH News*
<http://www.nih.gov/news/pr/mar2005/nhgri-16.htm>.

2. Download and copy worksheets entitled “Category Notes” and “3, 2, 1” (1 for each student) or have students make their own worksheets (make transparencies to use as guides).

Lesson

Engage

1. Ask students what they know about the X and Y chromosomes in humans.
2. Ask all students to write at least one question they have about the X and Y chromosomes in the space provided on the “Category Notes” page.
3. Discuss Slide 8, The Human Genome, and slide 14, Regulation of the Human Genome IV (Structures and Functions of Human Genomes).
4. Have students add notes to the first column of their “Category Notes” page.

Explore

Divide students into groups of four. Ask each student read one of the following articles:

“Researchers Unravel Secrets of X Chromosome”/Apr. 2005, *Nature Update* (BioEd)

“Y Chromosome Reveals Hidden Sequence”/Jan. 9, 2005, *Nature Update* (BioEd)

“Women Get Extra Dose of X Chromosome Genes” /Mar. 16, 2005, *From the BCM Labs* (BioEd)

“Studies Expand Understanding of X Chromosome”/Mar. 16, 2005, *NIH News*

<http://www.nih.gov/news/pr/mar2005/nhgri-16.htm>

Explain

Ask each student to complete a “3-2-1” activity sheet. Students are to list three things they learned, two things that surprised them, and one new question they have after reading their articles.

Elaborate/Extend

As a group or class, decide on and add information to the second column of the notes.

Evaluate

Ask each student to highlight the most important information in the first two columns of the note page. In the third column, have each student explain the significance of the highlighted information he or she chose.

Going Further

Not all animals have the same genetic strategy for determining sex. For example, read the *Nature News Update* on BioEd Online titled “Duck-billed Platypus Boasts Ten Sex Chromosomes.”

Have students investigate other organisms. This is a great time to discuss adaptation and evolutionary successes. For example, why is there an evolutionary advantage to having two sexes?

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What Can We Learn From the X Chromosome? Lesson Plan

Category Notes

3-2-1 Worksheet