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## Karyotype analysis activity answers

This exercise is designed as an introduction to genetic studies on humans. Karyotyping is one of many techniques that allow us to look for several thousand possible genetic diseases in humans. You will evaluate 3 patients' case histories, fill out their karyotypes, and diagnose any missing or additional chromosomes. Then you will conduct research on the Internet to find websites that cover some aspects of human genetics. If this is a task for a class, turn over a total of 7 responses to paper (2 for each patient, 1 for Internet search). LESSON PLAN Name: Katie Weber Lesson Title: Karyotyping Activity Date of Lesson: TBD Length Lesson: 50 Minutes Description of class: Name of course: Biology Grade level: 9th Grade Honors or regular: Either Source of the lesson: TEKS corrected: (6) Science concepts. The student knows the structures and functions of nucleic acids in the mechanisms of genetics. The student is expected to: (F) identify and analyze karyotypes. Overview Students will conduct an online activity where they create karyotypes, analyze them and use them to make patient diagnoses. Name: \_\_\_\_ Open Internet Explorer. Go to the following URL: Read the introduction carefully. When you're done reading, click the button at the bottom of the patient stories page. Read this page carefully with some very short notes on the three patients' cases in the table below: Patient A Patient B Patient C Next, click the button at the bottom of the page named Patient A. Complete Patient A's karyotype as directed. When finished, carefully read the page titled Patient A's Karyotype and answer the questions in the room below: A1: What notation would you use to characterize Patient A's karyotype? A2: What diagnosis would you give Patient A? Then click the button at the bottom of the page named Patient B. Complete Patient B's karyotype as directed. When it's finished, answer the questions on the page called Patient B's Karyotype in space below: B1: What notation do you want to use to characterize Patient B's karyotype? B2: What diagnosis would you give Patient B? Then click the button at the bottom of the page named Patient C. Complete Patient C's karyotype as directed. When finished, answer the questions on the page called Patient B's Karyotype in the room below: C1: What notation would you use to characterize Patient C's karyotype? C2: What diagnosis would you give patient C? A few additional questions What are the benefits of being able to see images of people's chromosomes? (Even the unborn babies.) What are the drawbacks of this type of technology? II. Results or results Students will be able to: Pairs of homologous chromosomes. - a karyotype. - Use a karyotype to make a medical diagnosis. - Describe representative chromosomal disorders. III. Necessary resources, materials and supplies - Computers with Internet access - preferably one per student IV. Supplementary materials, handouts. - Copies of the Karyotype Activity Lab Sheet-a per-student Five-E Organization Teacher's Probing Question Student don't engage: The teacher initiates a class discussion about whether students think it's possible to see chromosomes. Today we are going to make and investigate karyotypes on the Internet. Karyotypes are images of people's chromosomes. The teacher will provide a brief overview of how a karyotype is done using the following web page (or another web page of the teacher's choice) as a reference: Do you think it is possible to see chromosomes? Why would anyone want to see a picture of a set of chromosomes? What can a picture of chromosomes tell you? The answers vary. They can be seen under very high magnification. To see if there are any problems. Whether the person is a boy or a girl; if they may have any genetic problems explore: Students work independently at the lab after lab sheet and answer the questions about it. The teacher circulates to be sure that all students are successful in completing the activity; check their answers to the questions on the laboratory sheet. What did you find for Patient A? Patient B? Patient C? Were you able to match all chromosomes correctly, or did you run into any problems? The answers vary. Students may have problems especially in mating sex chromosomes since X and Y chromosomes look so different from each other. Explain: The teacher will ask a number of students to answer the questions on the lab sheet. If a student reports an incorrect answer, ask another student if they found something else. Make sure that each student understands how to use the correct notation to denote chromosomal results. Give a new situation and ask them to come up with the correct designation as a class. What is the term for Patient A? What is the diagnosis for Patient A? What is the term for Patient B? What is the diagnosis for patient B? What is the term for Patient C? What is the diagnosis for patient C? What would be the term for a patient with Turner's syndrome (having only a single [X] sex chromosome)? 47, XX, +21 Down's syndrome. 47, XXY Klinefelter's syndrome. 47, XY, +13 Trisomy 13 syndrome. 45, XO Extend/Elaborate: The teacher will initiate a class discussion about the pros and cons of making such technology available to people. What can be some of the benefits of giving people access to caryotypes? What can be some of the disadvantages of them? Diagnosis of genetic diseases; planning for a child who wants a genetic disease. People can use this information to determine the outcome of a pregnancy; it can cause mental about the inevitable. Evaluate: Today we have learned that it is possible to look at a picture of human chromosomes to count them and determine whether the chromosome number is normal or abnormal. Professionals use these karyotypes to diagnose diseases in the same way that you did today. The teacher will collect and formally evaluate the laboratory sheets. The questions are on the lab sheet. The answers vary. Go to main content Skip nav destination

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