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Genetic engineering simulations webquest answer key

From cucumbers and carrots to white rice and wheat, we humans have changed the genes of almost every meal we eat. For nearly 10,000 years we have been engineering plants by holding seeds from the best crops and planting those next season. After this practice, year after year, it resulted in slow but steady changes – and a substantial cumulative effect. We also changed the genetic makeup of crops by cross-pollinating. About 8,000 years ago, for example, farmers in Central America crossed two mutant strains of a ceslava plant called Balsas teosinte and produced the first corn on the cob. We have had success with the above methods (especially cross pollination), but since they rely on random mixing of all tens of thousands of plant genes, the chance to produce a crop with the desired feature resembles winning the lottery. Today, scientists can produce a change quickly by selecting a single gene that can result in the desired feature and inserting that gene directly into the organism's chromosome. Oddly enough, genes from organisms that are different as bacteria and plants can be successfully inserted into each other. These activities allow you to compare the traditional method of selective nobility with one of the latest transgenic methods. Rick Groleau is editor-in-chief of NOVA Online. home + should we grow them? + engineer crop + what is for dinner? + opinions links + interviews + what about this fish? + discussion synopsis + tapes & transcripts + print + frontline credits + nova + wgbh + wheat photos wheat ©h. david sewell / corbis new content copyright ©2001 pbs online and wgbh / frontline / nova [there was an error in the processing of this directive] Genetically modified organisms Webquest This lesson is aimed at students of the College of Biology ranging from advanced students to 10. This includes the difficult aspect of reading and writing along with the lesser aspect of philosophy or social morality. Before starting this webquest, students will need a basic understanding of genetic inheritance and the relationship between physical characteristics and their genetic resource. Introduction Genetic modifications are relatively new advances in science. These new technologies allow for almost unlimited possibilities of handling living organisms. However, the field is surrounded by as many debates as scientific progress inside. Some people think that any such change is immoral; others think that the potential for medical progress is worth any risk. Using the following WebQuest, you will learn about several (though not nearly all) genetic modifications are used today, along with several discussions regarding these technologies. Finally, you will take a position on the topic of genetic modification based on your data and personal For teachers: Illinois State Standards applicable: 12.A.4a Explain how genetic combinations produce visible effects and differences between physical features and cellular function of organisms. 12.A.5b Analyze the transmission of genetic features, diseases and defects. Steps 1-3 are applicable to all students, giving them an overview of genetic content. Depending on the class level, step 4 or step 5 will order students to write a document advocating their personal position on the latest uses of biotechnology. The task of the student your task is to read each of the given links and complete all related mini-tasks in steps 1-3. You will have a running document on all questions written in bold, followed by your answer to each question. In the end, you will hopefully have created an informed opinion on the topic of genetic modification. In step 4, you will then need to indicate and defend your position in a well-folded paper. For higher classes, you can replace step 5 for step 4. Step 5 is designed to introduce you to primary research. Step 1 Step 2 Step 3 Step 4 Step 5 Section for Steps 1-3 Step 1 - Check selective breeding and gene modification 1) Click on the following links and browse the information: a) b) c) 2) Answer the following questions: a) When two organisms are selectively breed together, the parents are homozygic, heterozygous or homozygous dominant for the properties that are selected for? b) Draw punnett square representing this cross. (c) Indicate two pos selective nobilees. (d) Indicate the two disadvantages of selective nobilia. e) How long have people selectively kept animals and plants? Step 2 – Researching GMO technology While there is GMO technology through many avenues of science, one of the more strongly discussed issues is GMO in our agriculture. This is because they have a huge impact on our health and also on our environment. 1) Click on the following links: a) b) 2) Answer the following questions in at least one well structured paragraph: a) After reading this site, what is your position on meeting the food requirements of an ever growing global population? b) Were there any statistics that you found shocking? 3) Click on the link below to read about the effects that GMO Round Up Ready beans were meant to have on the environment, and what is becoming an emerging problem with this technology. a) 4) Write Article. Step 3 - Explore the development of GMOs through selective breeding or through gene manipulation in the laboratory 1) Click on the following link: a) b) Try to go through both selective breeding and courses for handling genes located on the right side of the page. 2) Write notes about the steps you take through tutorials. 3) Answer the following questions: a) For selective breeding: i) How many generations did it take to get to the optimal harvest? (ii) What are the negatives for this type of plant nobility? b) For gene manipulation: i) What is a vector? ii) What gene besides Bt has been added to the vector? iii) Why might it be necessary to have two different growth media? iv) What is the purpose of spraying the plant growth medium with herbicide? Why does the herbicide determine which plants contain the correct gene? 4) Click on the link below. This link will guide you through a brief overview of 12 different cases for GMO crops, and ask if you think we should grow them. a) b) After reading each case, click on your answer, which bases your opinion on each case itself. At the end of the record, how many yeses and no answers you gave. 5) Write three paragraphs of the statement on how you answered at least 3 cases. Explain your reasons behind each case. 6) Click on the what's for dinner link: a) b) Click on the different parts of this diagram to read descriptions of new technologies emerging for GMOs. 7) Write a paragraph of the statement of your opinion on food vs non-food items (cotton, flowers) that are being developed for the further use of GMO technologies. 8) For further reading about scientists' views on GMO crop technology, click on the following link: a) b) Read the scientists' statements in all five categories. This can provide useful information to support your position in your paper. Steps 1 through 3 of the response will be graded according to the section at the bottom of the page. Click here to review the column. Step 4 - Write a place document! Based on what you have learned about GMOs write a positional document on whether GMOs should be grown for crops around the world. You may be completely pro-GMO cultivation, totally against GMO cultivation, or partly for growing certain GMOs, perhaps only under specific regulations or guidelines. Regardless of your feedback and attitude, provide referenced processing for each of your points supporting your position. The document should contain at least 4 well-developed support points (each worth 20 points). Grammar, mechanics, organisation (work/position clearly stated, introduction, conclusion), creativity, originality and references (20 Optional Step 5 - S stand (aimed at 12th graders) 1) Read the following article about the controversies surrounding GMO technology: a) 2) Choose 2 ethical dilemmas regarding genetic technology and write one page of paper to defend your position. Step 5 - Primary Literature 1) Enter the www.jstor.org the browser URL. a) Find the search bar and click Advanced Search below. b) Enter Genetic Modification in the first search box and debate in the second search box. i) Make sure that each field is followed by full text.c) Under these fields, make sure Include only content that I have access to is selected, and include links to external content is not checked. d) Select the article type and limit the time period to the last 5 years. e) Finally click on the search. 2) Choose 1 of the following search results from the above search: a) Loci evolution: How predictable is genetic evolution? Genetic contributions to the sustainability of agriculture c) A consistent approach to the evolutionary consequences of genetic and non-genetic heredity. d) Targeting Capital: A cultural economy approach to understanding the effectiveness of the two anti-genetic engineering movements 3) Open the full version of the article you have chosen. a) Review the article and see what a scientific article looks like. i) Pay attention to section formatting, writing style, charts and charts, and the page of works (bibliography) cited. 4) Read abstract and write in your own words what you think the research was about and what the researchers found out from their study. Now that you have completed this WebQuest, we hope you are more informed and aware of the controversy surrounding new areas in biotechnology. As you approach the voting age, you will be able to have a direct impact on many of these discussions. Hopefully now you will have more knowledge and decide to make informed decisions in the future. STEPS 1 - 3 RUBRIC Exceptional All points earned Admirable -3 Points Development -6 points Requires improvement -10 points Internet usage (links available) Successfully uses the proposed internet links to find information and navigate within this site easily without help. It is usually possible to easily find information and navigate within this site without help using recommended internet links. From time to time, you can easily find information and navigate within these sites without help using suggested internet links. It requires assistance or supervision to use and/or navigate the proposed Internet links. WebQuest Tasks Completed All areas of the project have been solved and processed with a high degree of sophistication. The project is interesting and finished. The project is only partially The project

presented demonstrates great ideas. (Between 75% and 100% complete) The project is only partially completed. The submitted project shows a moderate level of thinking. (Between 50% and 75% complete) The project is incomplete, and/or it is clear that a small effort went into project development, and/or the project is less than 50% complete. Classroom time was used to work on the project. The conversations were not disruptive and focused on work. Classroom time has been used to work on the project most of the time. The conversations were not disruptive and focused on work. Class time was used to work on the project most of the time, but conversations were often disruptive or did not focus on work. The student did not use the time in the classroom to work on the project most of the time and/or was very disruptive. Grammar, format, spelling The last part of the work was free of grammatical, spelling, and formatting errors. The final body of work had 1-2 errors related to grammatical, spelling, and formatting errors. The final body of work had 3-5 grammatical errors, spelling and formatting. The final body of work had major grammatical errors, spelling, and formatting. Errors.

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