**10 SCIENCE BIOLOGY ASSIGNMENT**

Genetic Technology



Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Teacher:\_\_\_\_\_\_\_\_\_\_\_\_

Form:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Due date:\_\_\_\_\_\_\_\_\_\_\_

**Aim:** This assignment will allow you to research information about genetically modified food.

1. Choose one example of a genetically modified crop.

 Corn  Wheat  Rice  Canola  Chicory

 Squash  Potato  Soybean  Alfalfa  Cotton

 Banana  Tomato

 Include the year, atomic model name, scientist who discovered or developed that

**1. Choose one example where scientists have or are attempting to genetically modify an organism.**

 Use information from pages 8, 9 of text book.

 Include the year, atomic model name, scientist who discovered or developed that specific atomic model.

 Must be neatly hand drawn, in pencil, using a ruler, with an appropriate scale.

**2. Prepare a report which answers the following questions on your chosen example.**

 What is genetic modification?

 Why are scientists genetically modifying the organism you have chosen?.

 What are the advantages of genetically modifying this organism?

What is the definition of a genetically modified plant?

1. What are the areas of greatest promise and the consequences of greatest danger in the modification of crop plants?
2. What are the environmental advantages and disadvantages of genetically modified foods?
3. What are the health benefits and health risks of genetically modified food?
4. What are the economic consequences?
5. Who benefits from this , who is harmed. ( These are the stakeholders)
6. What is the impact of genetically modified foods on the average student at Cherokee High School?

Choose one example where Scientists have, or are attempting to, genetically modify an organism then prepare a report which answers the following questions:

|  |  |  |
| --- | --- | --- |
|  | **Possible Mark** | **Your mark** |
| What is genetic modification? | 2 |  |
| Why are scientists genetically modifying the organism you have chosen? What are the advantages? | 6 |  |
| How are scientists doing this? What techniques are they using? Diagrams will help. | 6 |  |
| Explain any disadvantages to genetic modification. Why are some people worried about it? | 3 |  |
| Do you think genetic modification should be permitted? Justify your answer. | 2 |  |
| References set out as in student diary | 3 |  |
| Presentation | 2 |  |
| Diagrams | 2 |  |
| Total | 26 |  |

* You should use more than one type of source of information eg internet, book, newspaper article
* Your report should include diagrams which have captions or titles and are referred to within the text
* The assignment can be hand written or typed and printed. However you will need to hand in your hand written notes with the assignment.
* This page should also be stapled to the front.

|  |  |
| --- | --- |
| **Beneficial product traits** | **... in these crops** |
| **Bt crops** are protected against insect damage and reduce pesticide use. Plants produce a protein -- toxic only to certain insects -- found in a common soil bacterium called *Bacillus thuringiensis*, or Bt. | corn, cotton, potatoes  Future: sunflower, soybeans, canola, wheat, tomatoes |
| **Herbicide tolerant crops** allow farmers to apply a specific herbicide to control weeds without harm to the crop. Gives farmers greater flexibility in pest management and promotes conservation tillage. | soybeans, cotton, corn, canola, rice  Future: wheat, sugar beet |
| **Disease-resistant crops** are armed against destructive viral plant diseases with the plant equivalent of a vaccine. | sweet potatoes, cassava, rice, corn, squash, papaya  Future: tomatoes, bananas |
| **High-performance cooking oils** maintain texture at high temperatures, reduce need for processing and create healthier food products. The oils are either high oleic or low linolenic. In the future, high stearate. | sunflower, peanuts and soybeans |
| **Healthier cooking oils** have reduced saturated fat. | soybeans |
| **Delayed-ripening fruits and vegetables** have superior flavor, color and texture, are firmer for shipping and stay fresh longer. | tomatoes  Future: raspberries, strawberries, cherries tomatoes, bananas, pineapples |
| **Increased-solids tomatoes** have superior taste and texture for processed tomato pastes and sauces. | Tomatoes |
| **rBST** is a recombinant form of a natural hormone, bovine somatotropin, which causes cows to produce milk. rBST increases milk production by as much as 10-15 percent. It is used to treat over 30 percent of U.S. cows. | RBST (milk production) |
| **Food enzymes**, including a purer, more stable form of chymosin used to curdle milk in cheese production. It’s used to make 60 percent of hard cheeses. Replaces chymosin of rennet from slaughtered calves stomachs. | Chymosin (in cheese)  --the *first* biotechnology product in food |
| **Nutritionally enhanced foods** will offer increased levels of nutrients, vitamins and other healthful phytochemicals. Benefits range from helping developing nations meet basic dietary requirements to boosting disease-fighting and health-promoting foods. | Future: protein-enhanced sweet potatoes and rice; high-vitamin-A canola oil; increased antioxidant fruits and vegetables. |

Many people feel the use of genetic modification in farming, animals and humans is wrong, and that it goes against nature or their spiritual beliefs. Others think it's wrong because it allows big companies to gain more control of the food chain. Genetic modification allows scientists to take a gene from one species and insert it into a completely different species that it could never naturally breed with, so it is possible vegetarian, halaal, kosher and other rights may be ignored.

Think a little bit and answer these questions:

What is the best evidence that the CaMV promoter is safe to eat?

What can be substituted for antibiotic resistance genes as a selectable marker?

Why would it be beneficial to biotechnology to save biodiversity?

What would be the negative effects of other plants developing herbicide resistance?

What would be the negative effects of insects developing Bt toxin resistance?

Would either of the two resistances have a negative effect on native populations of plants?

Transgenic Organisms Assignment.

Name=\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. Mark= /12

Task.

Choose an example of a transgenic organism. There are a lot of them on the net(if you cannot find one do Golden Rice **OR** Bt-Corn). Then fill in the table below on your transgenic organisms.

You will need to use the internet.

You will need to record at least two sites that you used.

You need to use the correct layout shown in your student diary to show your references.

An example has been shown below.

|  |  |  |
| --- | --- | --- |
|  | Information | Mark |
| Chosen Transgenic organisms | Glofish | 1 |
| Describe what has been done | A gene extracted from a [jellyfish](http://en.wikipedia.org/wiki/Jellyfish), that naturally produced bright green [fluorescence](http://en.wikipedia.org/wiki/Fluorescence) was inserted into fish DNA.  As a result the fish glow when light is shone on them. | 3 |
| Sate the **reasons** that this Transgenic organism has been developed. | The fish have been produced to be amusing(1 MARK). People will buy them for entertainment(1 MARK).  The product is designed to make money for the company(1 MARK). | 3 |
| State any reasons why people might **disagree** with the existence of this Transgenic organism. | It is not done for any scientific purpose, just to make money  (1 MARK).  The company owns genes, and some people think that no one should own genes(1 MARK)..  It is tampering with nature.  It is playing God(1 MARK).  The GMO fish might mate with normal fish and spread the new genotype. | 4 |
| Internet reference 1. | Gofish. (2010). Retrieved November 20, 2013, from <http://www.GloooGlo.wa.au/(Glofish)> (2010) (20.11.2013) | 1 |
| Internet reference 2. | Glowing fish. (2011). Retrieved November 20, 2013, from <http://www.transmission.wa.au/(Goldfish)> (2010) (20.11.2013) | 1 |
| TOTAL | | 13 |

|  |  |  |
| --- | --- | --- |
|  | INFORAMITON | MARK |
| Chosen Transgenic organisms |  | 1 |
| Describe what has been done |  | 3 |
| Sate the **reasons** that this Transgenic organism has been developed. |  | 3 |
| State any reasons why people might **disagree** with the existence of this Transgenic organism. |  | 4 |
| Internet reference 1. |  | 1 |
| Internet reference 2. |  | 1 |
| TOTAL | |  |

**IMPORTANT INFORMATION**

**Plagiarism**

This assignment is to be done individually, not with a partner.

You must write in your own words not copy sentences word for word from another student or another source.

Plagiarising = instant zero on assignment and you will have to re-do it.

**Referencing**

You must reference your information.

Include a minimum of 4 references.

Include a minimum of 2 different sources of information.

Use the referencing style below and found at the back of your school diary.

If you are still unsure on how to reference correctly, ask your teacher.

**How to reference a book:**

Tsutaya, K. (2011). Crafting with Cat Hair: Cute Handicrafts to Make with Your Cat. Philadelphia: Quirk Books.

Author’s last name, first letter of first name. (Year of publication). Title of book. Place of publication: name of publisher.

**How to reference a web site:**

Rice, C. (2013). Cute cats could be key to learning new languages. Retrieved February 8, 2014 from [www.bbc.co.uk/news/technology-25103362](http://www.bbc.co.uk/news/technology-25103362)

Author’s last name, first letter of first name. (Year of publication). Title of website. Date you retrieved the information, website

**Presentation**

Cover page with your full name, form, teacher and assignment title.

Neat writing (if you struggle with this, type your information).

Correct spelling, grammar and full sentences.

The use of headings to separate each section.

Clear, labeled diagrams.

Relevant images or pictures.

Assignment neatly stapled together with this sheet attached to the front.

**Assessment policy**

Have sick note/legitimate reason from parent = new negotiated due date.

Assignment not submitted on due date and no sick note from parents = -20% mark

Assignment not submitted on new negotiated due date = -40% mark

+ Letter home to parents

+ Must attend academic completion to complete assignment

**OR**

Submit assignment to student services before academic completion date and academic completion not necessary.

Academic completion not attended = zero on assignment + Saturday detention

**If you know that you cannot submit your assignment on the due date, let your teacher know BEFORE the due date (email them if you are not in school) or just email them your assignment the night before.**

**NOTE TAKING SHEET**

You may use this page or attach your own hand written notes instead.

|  |  |
| --- | --- |
| **Content** | **Notes** |
| Name of chosen  genetically  modified  organism |  |
| What is genetic  modification  (min 2  sentences) |  |
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**MARKING KEY**

|  |  |  |  |
| --- | --- | --- | --- |
| **Content** | **Description** | **Possible**  **mark** | **Your**  **mark** |
| Timeline | Appropriate title  Neat - used a pencil and ruler  Appropriate scale - stretches across full page  Correct dates are in order  Correct information for each date | 1  1  1  1  8 |  |
| Scientist  research | Date of birth  Place of birth  Date of death  Early life - minimum 2 sentences  Summary of history at time - minimum 2 sentences  Description of specific atomic model - minimum 2 sentences  Atomic model diagram - neatly hand drawn in pencil  - Correctly labeled  - Takes up minimum 1/3of page  Awards or recognition  Other jobs or professions - minimum 2 sentences  Other contributions to science - minimum 2 sentences  Quote or interesting fact | 1  1  1  2  2  2  1  1  1  1  2  2  1 |  |
| Notes | Note taking sheet is complete or own hand written notes  are attached | 2 |  |
| Referencing | Minimum of 4 references  Variety of sources - minimum of 2 book references  Referenced in correct format | 1  1  1 |  |
| Presentation | Cover page - full name, form, teacher, assignment title  Neat writing  The use of headings - clear separation of sections  Correct spelling, grammar, full sentences  Relevant images or pictures | 1  1  1  1  1 |  |
| **Total mark** | | 40 |  |

Mark as percentage %

Teacher’s comments:

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