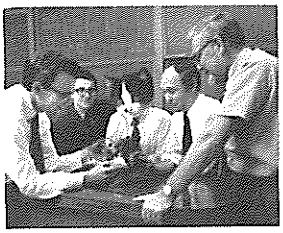
10 SCIENCE BIOLOGY ASSIGNMENT: GENETICALLY MODIFIED CROPS 2016

Name:_____

Form:_____



Teacher: Miss Cerny

Due date:

MARKING KEY

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

Hint: chapter 1.4 of your e-book has information you can use and then reference. I have also attached two pages of information you can read.

Plagiarism:
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.

Assessment policy:
Give me a sick note/legitimate reason from parent BEFORE due date = new negotiated due date.
One day late = -20% taken off mark
Two days late = -40% taken off mark
Three days late = mark of zero given
After three days, students are required to attend a detention and are still required to submit the assignment.

If you are not at school the day this assignment is due, please email it to me by 4pm.

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MARKING KEY

Below are some of the arguments for and against the use of genetically modified (GM) food.

Arguments for the use of genetically modified crops

- GM crops are potentially more resistant to disease, can grow in less space, can provide greater yield and need less pesticide.
- Current agricultural methods will not be able to grow enough food to feed the 9 billion people predicted to populate the world by 2050. Genetic modification can improve crops more quickly than normal selective breeding processes.
- By adding 'toughness genes', scientists can make plants more tolerant of frost, drought and salinity (salt level). These genes can be turned 'off' and 'on' in different parts of the plant. Genetic modification is one tool that farmers can use to maintain or increase crop yields as the climate changes.

potentially (adj) possibly

resistant to (adj) not affected by

yield (n) amount produced

pesticide (n) chemical used to kill pests (insects)

selective breeding (n) choosing the strongest plants and animals to breed

tolerant of (adj) not affected by

- GM foods can improve a poor diet by providing nutritionally improved foods. This should have health benefits in both developing countries and developed nations. GM plants can also deliver medicines. For example, golden rice increases the intake of vitamin A, and bananas can carry a vaccine (cure) for the disease hepatitis D.
- Genetic modification may be able to remove allergens from nuts. Eleven different proteins called allergens in peanuts are known to cause allergic reactions. Scientists are developing genetically modified peanuts in which the two strongest allergens are removed.

allergen (n) something that causes an allergy

- GM organisms and food products are studied and tested more than normal foods. There is no strong evidence to suggest that approved GM foods are more dangerous than normal foods. Because of the amount of testing they undergo, they may actually be safer!
- In Australia, GM foods are regulated, ensuring that only assessed and approved GM foods enter the food supply.

regulated (v) controlled

evaluation (n) judging

Arguments against genetically modified crops

- Some people say that GM crops are not safe to eat. They feel that there has not been enough evaluation of the potential risks that could come from changing the genetic make-up of an organism. They are concerned that new allergens could be created.
- Herbicides are chemicals that are used to control weeds. Some people think that the genes for herbicide resistance could be transferred from the GM crop to weeds in the environment. This would make it more difficult to control weeds.
- Some people think that antibiotic resistance may develop in humans and farm animals that eat GM foods. This could make antibiotics less effective in treating disease.
- Some food labelling may not be good enough to alert people to GM ingredients in food.

antibiotic resistance (n) when an organism is not affected by antibiotic medicines

patent (n) protection of an invention so that others cannot copy it

dominate (v) to have complete control over

ethical (adj) relating to right and wrong actions

Social and ethical concerns

- Large companies that own the patent (copyright) for the GM plants may be able to dominate the world food market by controlling the distribution of the genetically modified seeds.
- Using genes from animals in food plants may create ethical or religious problems. For example, eating traces of genetic materials from pork in a vegetable or fruit could be a problem for some religious groups or vegetarians.

vegetarian (n) a person who does not eat meat

- Some people believe that genetically modifying plants and animals is 'playing God' and is unnatural. They say that genes from unrelated species should not be mixed.

1. In your **own words**, and in language you understand, write a paragraph (minimum 3 sentences) that **explains** what genetic modification is. (3 marks)

Using genes from one organism (1)
and inserting them into another organism (1)

more info (1)

Choose either GM canola OR Golden rice

Name of your GM crop: _____

2. **Explain** how your chosen crop has been modified (changed).
What is a characteristic that is has now that it didn't have before it was modified? (2 marks)

Golden rice - now has beta-carotene in it (1)
which converts into vitamin A when
in the body (1)

OR

GM canola - is now resistant to herbicide (1)
so when it is sprayed the weeds die
but the canola doesn't (1).

4. **Describe** two advantages of genetically modifying your **chosen** crop. (2 marks)

Golden rice

-Has beta-carotene which converts to vitamin A in the body, reducing the risk of blindness. - crop yields are higher.

- Spending less on healthcare - Reduces use of pesticides

GM canola

- resistant to herbicides - allows growers to compete

- Reduced production costs in international markets

one mark for each

5. **Describe** three benefits of GM crops in general (***not including*** the benefits you described in question 4). (3 marks)

-GM crops are usually more resistant to disease.

- GM crops can grow in less space.

- GM crops can provide greater yields.

- GM crops require less pesticides

- GM crops usually have a longer shelf life.

- GM crops usually have added nutritional value.

- GM crops usually have better texture or flavour.

one mark for each

6. Some groups of people are against genetically modified crops (anti-GM). **Describe** three claims these groups of people make against GM crops and for each one explain whether or not you think it is valid (rational, justifiable) and **explain** why/why not. (6 marks)

Claim 1: one mark for claim.

One mark for own opinion.

Claim 2: one mark for claim

one mark for own opinion

Claim 3: one mark for claim

one mark for own opinion.

7. **Decide** whether you support the continued use of GM foods in Australia and **justify** your decision (explain why). (2 marks)

one mark for decision

one mark for reason why.

8. Look at the following groups in Australia and state whether they are for growing GM crops in Australia or against growing GM crops in Australia. For each group, write a **quote** you found on the website that supports your answer. (8 marks)

Group	Pro-GM or anti-GM	Evidence to support your answer
Crop Life Australia www.croplifeaustralia.org.au	Pro-GM (1)	direct quote that proves (1)
Biotechnology Industry Organization http://www.bio.org/	Pro-GM (1)	Direct quote that proves (1)
Producers Forum www.producersforum.net.au	Pro-GM (1)	Direct quote that proves (1)
True Food Network www.truefood.org.au	Anti-GM (1)	Direct quote that proves (1)

Book

Book with two authors

Shermer, M., & Benjamin, A. (2006). *Secrets of Mental Math: The Mathemagician's Guide to Lightning Calculation and Amazing Mental Math Tricks*. New York, USA: Three Rivers Press.

Book with three or more authors

Bulliet, R. W., Alley, R. B., Broecker, W. S., & Denton, G. H. (2011). *The fate of Greenland: Lessons from abrupt climate change*. Cambridge, MA: MIT Press.

Book with editor

Kasdorf, W. E. (Ed). (2003). *The Columbia guide to digital publishing*. New York, USA: Columbia University Press.

Book with different editions

Nagle, G., & Cooke, B. (2012). *Geography Study Guide: Oxford Ib Diploma Programme* (2nd ed.). Oxford, UK: Oxford University Press.

Website

Website with no author (put title of page at the front)

Aranmore Catholic College. (2014). Retrieved from http://www.aranmore.wa.edu.au/

Website with no date

The Zadkine Museum. (n.d). Retrieved from http://www.france.fr/en/museums/zadkine-museum.html

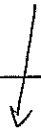
Video file

Reference list

Minimum of two references. (1 mark)

Minimum of two different sources (1 mark)
(Book, encyclopedia, video, website, journal, magazine, newspaper).

Referenced using the style on the previous page. (1 mark)



no mark if there is even one tiny mistake.

Assignment is neatly written or typed. (1 mark)

Correct grammar and spelling. (1 mark)

Total mark: **/31** **%**

Teacher comments: on Seqta