

Use the following link to answer the next set of questions:

<https://classes.soe.ucsc.edu/cmpe080e/Spring05/projects/gmo/index.htm>

5) Name 6 benefits of GM organisms (Click “Pro” on the left of the page)

- a)
- b)
- c)
- d)
- e)
- f)

6) Name 5 controversies associated with GM organisms (Click “Cons” on the left of the page)

- a)
- b)
- c)
- d)
- e)

7) Does the law in our country require genetically modified foods to be identified on the label?
(Click on “US Laws” at the left of the page)

Part 2: How are GM organisms (plants) made?

Use the following link to learn how GM plants are made:

http://www.unc.edu/depts/our/hhmi/hhmi-ft_learning_modules/plantmodule/transgenicplants.html

Describe the 6 steps given for making a GM (transgenic) plant:

Part 3: Uses of Genetic Modification

A. Pesticide-Resistant Crops

Use the following link to read the article and answer the questions below:

http://www.gmo-compass.org/eng/agri_biotechnology/breeding_aims/146.herbicide_resistant_crops.html

1) How can too many weeds affect crop yield?

2) Selective herbicides are only able to kill specific types of plants and often leave some weeds in the field to continue to grow. Why would a farmer choose to use a selective herbicide?

- 3) Non-selective or broad-spectrum herbicides will kill all types of weeds. Why can't farmers use this type of herbicide without using GM crops?
 - a)
 - b)
- 4) What are two other advantages of using herbicide-resistant GM crops?
 - a)
 - b)
- 5) What are three potential problems some people foresee happening if GM crops continue to be grown?
 - a)
 - b)
 - c)

B. Medicine

Use the following link to the article and answer the questions below:

<http://genetics.thetech.org/about-genetics/making-medicines>

- 1) Name 3 ways that genetic modification is used in medicine.
 - a)
 - b)
 - c)
- 2) Click on "New Therapies" on the left side of the page.
 - a) What is gene therapy?
 - b) Why is it a difficult procedure?
 - c) Why is the use of human stem cells controversial?

Use the following link to read the article. Click on the individual pictures at the bottom of the article to explore other organisms that are currently being researched.

<http://news.discovery.com/tech/ten-genetically-modified-crops.html>

Pick any of the 5 organisms from the article and complete the table below. Identify the organism and answer the following questions: 1) What modifications are being made? 2) What desired outcomes are researchers attempting to create or improve?

| | Organism | Modification | Desired Outcomes |
|---|----------|--------------|------------------|
| 1 | | | |
| 2 | | | |
| 3 | | | |
| 4 | | | |
| 5 | | | |

Part 4: Cloning

Dolly

Use the following link to read the article and answer the questions below:

<http://www.understandinganimalresearch.org.uk/how/areas-research/animal-cloning/>

- 1) Cloning creates a _____.
- 2) Why was the creation of Dolly such a significant scientific event?
- 3) Scientists created Dolly using the following procedure:
 - a) The _____, which contains almost all of the genes, from an adult udder cell was injected into an unfertilized _____ that had previously had its _____ removed.
 - b) The newly-created cell was then shocked with an _____ to cause the nucleus to fuse to the cell.
 - c) The nucleus, containing the DNA, came from a _____ sheep.
 - d) The newly-created embryo was implanted into a _____ sheep after it was cultured for _____ days to ensure it divided and developed normally.
- 4) Why do scientists want to be able to clone?