Getting to Know your GMO

Directions: With your partner use your laptop to navigate to the site http://tiki.oneworld.org/genetics/home.html or if you google “genetic engineering for kids” it should be the first link to pop up. You will do some review of material we have learned thus far, as well as get the basics of genetic engineering and modern genetics. Have fun!

USE SENTENCES AS NEEDED

1. On the home page, describe the basic definition of genetic engineering:

_______________________________________________________________

Before you begin, do you feel you are in favor of genetically modifying organisms or are you opposed to this practice. Why or why not?

________________________________________________________________________________

2. Scroll down to click on the first green arrow for “genes, snails, and whales.” Genes are __________________________ and are found in all __________________ things. Genes are packaged up into ___________________, which are found in this part of the cell (circle correct organelle in the diagram).

3. Click the next green arrow for “tried and tested.” How old is our planet approximately? __________________________ years. What happened to living things that weren’t able to change over the years?

Some factors that might influence an organism’s ability to survive include:

•

•

4. Click the next green arrow for “adapt or die.” A very well-known scientist named ______________________ studied how species change over long periods of time.

Change over a long period of time is known as e________________. This process happens as a result of random m________________ in genes, usually during cell
replication. Can you think of a species or trait of an organism that has changed over a long period of time or “adapted” to its environment? __________________________

5. Click the next green arrow for “coils, corkscrews, and copycats.” The two scientists W__________ and C__________ studied how DNA actually worked. Explain in your own words (briefly) how a cell makes a new cell with the same DNA:

A cell makes a new cell by

*5 bucks for the first pair to tell your teacher whose work Watson and Crick’s model was based on (Kidding...no, you’re not getting 5 bucks but you just got richer in knowledge)

6. Click the next green arrow for “gene tinkering and evolution on fast forward.”

What is our earliest example of “genetic engineering” and how was it done to get the best outcome? __________________________

7. An example of selective breeding is __________________________

8. Click the next green arrow for “so what is genetic engineering...”

What does it mean to genetically engineer something? __________________________

9. **Pros and Cons:** Describe one way GE is helpful, and one way it is not

**PRO**

**CON**
10. Click the next green arrow for “What’s wrong with genetic engineering?” The two main reasons genetic engineering is so appealing to people and businesses alike is because it saves t________________ and m________________.

11. How do big businesses that use genetically modified products impact small businesses or local growers? __________________________________________________________
   ___________________________________________________________________
   ___________________________________________________________________

12. What does it mean to “open source” information? ____________________________
   ___________________________________________________________________
   ___________________________________________________________________

13. Click the next green arrow for “Why the rush and It’s the same stuff.” How does America differ from countries in Europe when it comes to GMO’s?
   ___________________________________________________________________
   ___________________________________________________________________
   ___________________________________________________________________

14. Click the next green arrow for “What the companies are making now.” The two main GMO crops are ___________________ and ___________________.

15. What is it about these crops that makes them “modified?” ____________________
   ___________________________________________________________________
   ___________________________________________________________________

16. Click the next green arrow for “Poisonous Plants” and describe how you feel about eating transgenic plants: _________________________________
   ___________________________________________________________________
   ___________________________________________________________________

17. Click the next green arrow for “Scattering the genes.” How might a farmer who is opposed to genetically modified crops end up with a genetically modified crop? ____________________________________________________________
   ___________________________________________________________________
   ___________________________________________________________________
   ___________________________________________________________________

CONCLUSION: Has your opinion changed from the beginning of this activity? Explain
Regents Practice

1. To clone a mammal, a cloned embryo is often put into an adult female of the same species to continue internal development. The structure in which the embryo will develop is the
   (1) ovary
   (2) placenta
   (3) uterus
   (4) egg

2. The diagram represents a process used to modify bacterial cells.

   ![Diagram of bacterial DNA modification]

   In the diagram, arrows labeled X and Y represent the use of
   (1) clones
   (2) genes
   (3) receptors
   (4) enzyme

3. A tomato gene, known as the SIKLUH gene, has recently been discovered. The gene leads to the production of larger tomatoes. The gene affects fruit size by increasing cell layers and promoting extra cell divisions. In order to produce large fruit in other commercial plant species, scientists might
   (1) clone the genes of other types of plants until they develop larger fruits
   (2) breed the tomatoes with other fruits such as apples
   (3) insert the gene into other types of plants
   (4) stimulate the process of meiosis in the other plants

4. Which activity enables humans to produce new genetic combinations in other organisms?
   (1) selecting and breeding the organisms for specific traits
   (2) increasing the number of enzymes available to the organisms
   (3) growing organisms that reproduce asexually
   (4) decreasing the amount of DNA in the diet of the organisms

5. A scientist plans to cut a segment of DNA so that it can be inserted into the DNA of a bacterium, a single-celled organism. The scientist needs to use a special type of organic molecule to perform this cutting process. This molecule is
   (1) a lipid
   (2) an enzyme
   (3) a carbohydrate
   (4) a hormone