Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Period \_\_\_\_\_\_\_

**Genetic Engineering of Insulin**

Watch the following video clip. http://www.youtube.com/watch?v=m3925Pw-VwU

There is also a link to it on my wiki. It is 8 ½ minutes long. You should pause or review if necessary. Answer the questions below as thoroughly as possible.

1. What causes Type 1 diabetes?

The immune system attacks cells in the pancreas that produce insulin

1. Why do you think insulin needs to be injected rather than swallowed?

Insulin is a protein. It would be broken down in the stomach before it could be absorbed and used by the body.

1. How was insulin obtained prior to genetic engineering? Why was this not ideal?

From cows and other farm animals that were slaughtered. Scientist cold only extract a little insulin from the pancreas

1. What type of biomolecule is insulin?

Protein

1. What remarkable property of DNA makes genetic engineering possible?

The genetic code is shared by almost every living thing on the planet!

1. What is genetic engineering?

The insertion of DNA into the cells of an organism to produce a desired result.

1. What is the function of restriction enzymes?

It cuts the DNA molecule at specific places. They are sort of like molecular scissors ☺

1. What is the function of ligase?

Paste pieces of DNA together. Sort of like molecular glue ☺

1. What bacteria is used in the production of insulin? Where is it found?

E. coli. In the colon (last part of the large intestine)

1. What are plasmids?

Small loops of DNA found in bacterial cells

1. Why are plasmids good for genetic engineers to work with?

Their small size makes them simple and easy to work with.

1. What are the general steps in genetic engineering?
2. Restriction enzyme cuts the desired gene out of the DNA
3. Ligase Enzyme links the cut gene into the Plasmid DNA
4. Place plasmid into a bacterium
5. What are other uses for genetic engineering?

Create genetically engineered lab animals for research

Add genes to crops to give them traits like herbicide or insect resistance

1. What do people worry about related to genetic engineering?

The safety, particularly when it affects our food.