**February Notes: Day 8 Gel electrophoresis and Human Genome**

Name: Period: Date:

**Aim: Now that we know a lot about DNA what can we do with this information?**

**Do Now: Answer the following questions:
Why is DNA important?
What is a section of DNA called?
Where do we find DNA?
Why does DNA need RNA?**

**What is the Genome Project?**

In 1990, the United States began the

* The purpose of this project was to: all the approximately 20,000-25,000 in human
* the sequences of the 3 chemical pairs that make up DNA
* to this information in

The project was completed in (13 years later)

**Why was the Genome Project important?**

* The genome project allowed scientist to identify genes in a person’s DNA.
* This information can be used to identify a person of developing a like cancer or diabetes.
* In the future, it may be possible to these mutations with gene therapy.

**What are some negative effects of the Genome Project?**

* Health Insurance companies may the information collected in the Genome Project.
* Insurance companies may charge more to those people who have a for a costly disease even though they do have the disease yet.
* Insurance companies may insurance to any person who they feel may be at risk
* Employers may use this information to hire someone because the person may be at risk of developing a disease.

**How can DNA be used in paternity tests and solving crimes?**

* All living things have
* All cells have (except red blood cells).
* All nuclei have in them.
* Although we all have DNA, everyone's DNA is slightly (by less than 1%)
* If a cell is found at a scene or is used in a test, the DNA can be extracted (taken out) and analyzed for a DNA “ ” or uniqueness.

**Gel Electrophoresis**

* Gel electrophoresis is a where a scientist removes the DNA from the cell.
* Then, they the DNA at specific places with
* These cuts results in different piece of the DNA (fragments).
* The tiny pieces of DNA are put into a filled with and the scientist applies an current to the gel.
* The current attracts or “pulls” the fragments of DNA through the gel.
* The gel is made up with a lot of tiny holes.
* The smaller pieces travel through the gel the farthest because they have an easier time moving through the holes of the gel.
* The pieces move at all because they have a harder time getting through the .
* Because of the different rates that each size piece moves, the DNA pieces form “ ” in the gel.
* Scientists compare these bands to bands from another person’s DNA or to DNA left at the scene and look for bands.
* The bands that match, the more the DNAs are.

**Paternity Testing**

Using gel electrophoresis (“the DNA test”) is key in determining the of a child.

It is important to remember that the child’s DNA came from of the parents…50% from mom; 50% from dad…and the DNA should reflect this.

**Using Electrophoresis in Evolution**

Electrophoresis can also be used to determine of different organisms.

By comparing the matching bands between different , scientist can determine how close organisms are .

Example – A Chimpanzee's DNA matches a about %, while a dog only matches about 75%. This means the humans are more closely to than dogs.