**Go to** [**www.johnbio.weebly.com**](http://www.johnbio.weebly.com)**, download the Biotechnology Online Lab and click on each link for all parts of this lab. Click on the link name of each part for the website to pop up.\*\*You MAY need to use Internet Explorer to view animations! You will write your answers on the paper. You will turn this paper in when completed for a 50 points lab grade.**

**Part 1:** [**Click and Clone**](http://learn.genetics.utah.edu/content/cloning/clickandclone/)

 1. What are the 6 steps to clone Mimi the mouse?

a.

b.

c.

d.

e.

f.

 2. What is a somatic/cumulus cell?

3. Is it diploid or haploid?

 4. What color is Mini-Mimi, Mimi’s clone?

 5. What 2 cells were necessary to clone Mimi?

 6. What is a clone?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Part 2:** [**DNA Fingerprinting**](https://www.pbs.org/wgbh/nova/sheppard/analyze.html)

Read the Introduction, then click on Part 1: It Takes a Lickin’

1. Summarize the “crime”.
2. Describe the “suspects”
3. What must be created to solve the crime?

Click on Part 2: DNA Fingerprinting at the NOVA Lab (if having trouble loading then click on the link below) <https://docs.google.com/document/d/1oZwqkajjJT1ox7GZMyw0enOx7M6VhR-fR-FuJ9681Is/edit?usp=sharing>

1. Write down the steps as you work through the steps of creating a “Gel Electrophoresis”

STEP 1 –

a. What is the purpose of restriction enzymes?

b. What is important about the length of the fragments the restriction enzymes create?

STEP 2 –

a. What is agarose gel? What’s its purpose?

STEP 3 –

STEP 4 –

a. What is “electrophoresis”?

b. Explain HOW and WHY the DNA migrates down the tray (*HINT: This has to do with the CHARGE of DNA*.)

c. Compare the final destination of large fragments compared to small ones.

 STEP 5 –

STEP 6 –

STEP 7 –

a. What is the relationship between steps 6 and 7?

STEP 8 –

 4. Based on the DNA Fingerprint and the saliva sample, who was the culprit?

 5. Why is this pattern made by DNA called a “fingerprint”?

**Part 3:** [**Gene Therapy**](http://learn.genetics.utah.edu/content/genetherapy/)

**Click on “WHAT IS GENE THERAPY”, then answer the questions below**

1. Describe gene therapy.

1. How is gene therapy different from traditional approaches?

1. What is a vector? (**The answer is NOT just a virus!)**

1. What conditions are MOST likely to be helped with gene therapy?

**Navigate back to the original Gene Therapy page, then select “GENE DELIVERY: TOOLS OF THE TRADE”, then complete the table below**

**i. For each “VECTOR” below, describe HOW it aids in gene therapy**

 **HINT: Click next to the vector picture to navigate back to the toolbox each time.**

 ****

**Part 4:** [**Engineer a Crop**](http://www.pbs.org/wgbh/harvest/engineer/transgen.html)

Click on Engineer a Crop. Read the information, then click on the **Transgenic Manipulation Simulation**.

1. How do you create a transgenic plant?
2. Write down each step:
	1. STEP 1:
	2. STEP 2:
	3. STEP 3:
	4. STEP 4:
	5. STEP 5:
	6. STEP 6:
	7. STEP 7:
	8. STEP 8:
3. How was the plant tested to see if it was resistant to the pest?

**Part 5:** [**Guess What’s Coming to Dinner?**](http://www.pbs.org/wgbh/harvest/coming/coming.html)

Click on 3 items in the picture and describe how they are genetically modified.

* 1. FOOD ITEM 1:
	2. FOOD ITEM 2:
	3. FOOD ITEM 3:

**Part 6:** [**Should We Grow GM Crops?**](http://www.pbs.org/wgbh/harvest/exist/)

1. What does GM stand for?



1. Fill in the table as you work through the arguments for & against

 GM Foods.

1. After finishing the activity, are you PRO or CON Genetically

 Modified Foods?

 CIRCLE ONE: PRO CON

1. Explain WHY you feel this way.