DNA FINGERPRINT LAB

Problem: Who is the biological mom and dad of the discovered baby?

Background: Restriction fragment length polymorphisms (R.F.L.P.) will be used to determine if the DNA from your blood samples match the fragment pattern of the baby and that of your "significant other" spouse. This lab will provide evidence as to who the parents really are.

Procedure: Read carefully and check off each step after it is completed.

____ 1. Material you need:
- tape
- scissors
- one model EcoR1 restriction enzyme
- three lengths of DNA containing 100 base pairs (bp)
- specific number will be assigned by your teacher

____ 2. Cut DNA (assigned by your teacher) into three strips. Tape these three strips together so that spacing of bases are kept evenly. When completed, they should number 1 through 100.

____ 3. Slide the EcoR1 restriction enzyme paper model over the DNA you have taped together. Mark with a pencil, on your DNA strip a line where the enzyme shows a palindrome. This line should be between the G and A on the top row and the A and G on the bottom row. (A palindrome is a word that reads the same in both directions.) examples, madam, radar, a toyota

____ 4. After all lines are drawn on the DNA strip, with a scissors cut the DNA strip on the pencil line this will separate the DNA into fragments. This would be where the restriction enzyme (EcoR1) palindrome matched the DNA sequence.

____ 5. Count just the top row of nucleic bases of the cut DNA fragments. Then write that number on the back of that fragment. Do this to all of the fragments you have.

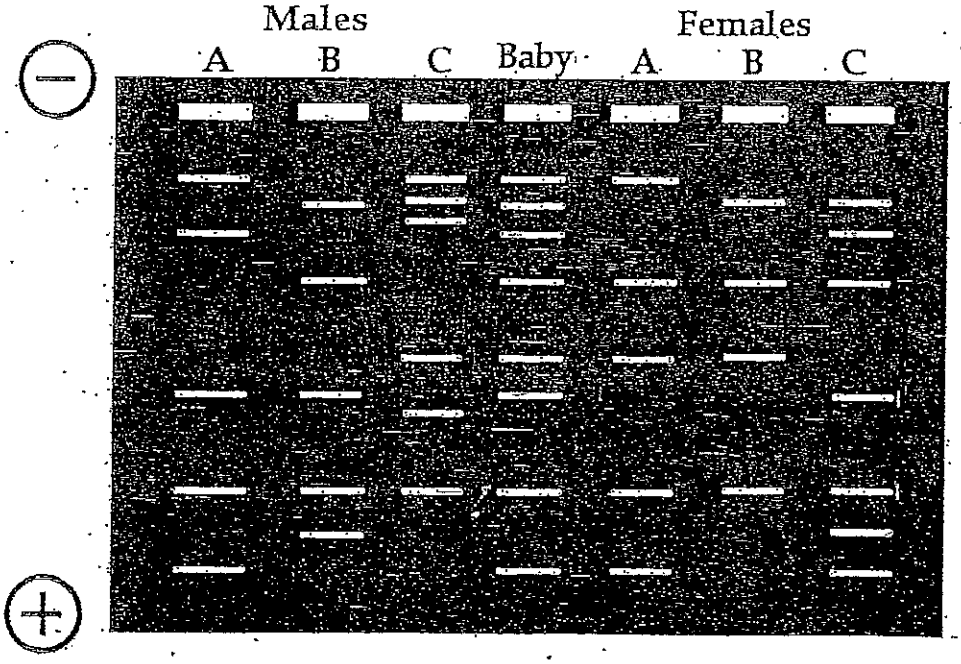
Gel Electrophoresis Model

Gel Electrophoresis Fragment Patterns

— Record your pattern here —

	Girls RFLP Pattern	Baby's RFLP Pattern	Boys RFLP Pattern
15			
14			
13			
12			
11			
10			
9			
8			
7			
6			
5			
4			
3			
2			
1			

Below is an example of an RFLP gel using radioisotopes to mark the DNA frgaments and an X-ray film to detect them. This test used 7 different samples.



Only one of the males and one of the females could be the parents the baby. Who are the parents? Why?

DNA Fingerprint Analysis Questions:

1. What did you create a model of in the lab today?
2. What was used to "cut" the DNA into fragments? (real name not scissors)
3. What is the name of the specific restriction enzyme used?
4. What is the process used to separate the DNA fragments based on the size of the fragment?
5. Which size fragments travel the farthest down the gel?
6. Does any two people have the same DNA fingerprint?

Read the "Applications of DNA analysis".

7. What type of inherited genetic diseases could be identified from DNA analysis?
8. What are common sources of DNA that may be left at a crime scene?
9. What are three applications of a DNA fingerprint?