

# Biotechnology WebQuest

WEBSITE #1: <http://www.pbs.org/wgbh/nova/sheppard/analyze.html>

1. DNA is unique for everyone with one exception. What would be an example of that exception? \_\_\_\_\_
2. What are DNA Fingerprints used for?
  - A) \_\_\_\_\_
  - B) \_\_\_\_\_

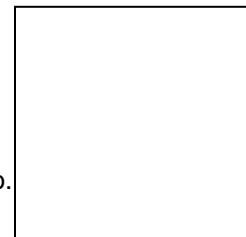
## **CLICK ON VIEW AND GO THROUGH THE INTERACTIVE**

### **Part I: "It Takes A Lickin'!"**

3. What "crime" was committed? \_\_\_\_\_
4. What bodily fluid was removed from the "crime scene" to get the DNA? \_\_\_\_\_
5. How many suspects are there in this crime? \_\_\_\_\_

### **Part II: "DNA Fingerprinting at the NOVA Lab!"**

6. What does a Restriction Enzyme do? \_\_\_\_\_
7. What is Agarose Gel? \_\_\_\_\_
8. What is Electrophoresis? \_\_\_\_\_
9. Smaller fragments of DNA move \_\_\_\_\_ that longer strands.
10. Why do you need to place a nylon membrane over the gel? \_\_\_\_\_
11. Probes attach themselves to \_\_\_\_\_
12. Which chemical in your "Virtual Lab" is radioactive? \_\_\_\_\_
13. Sketch the criminal's DNA Fingerprint in the box to the right.
14. Based on your DNA Fingerprint... **WHO COMMITTED THE CRIME???** \_\_\_\_\_



WEBSITE #2: <http://www.amnh.org/ology/>

Click on the GENETICS tab to the left, then scroll down and Click on the Quest for the Perfect Tomato. Then click Food for Thought.

15. Give **two** examples of genetically modified foods.

WEBSITE #3: <http://www.pbs.org/wgbh/harvest/coming/coming.html>

Click on each of the foods on the table to see what research is being done to bioengineer the foods. List 3 foods and describe how they are being modified.

- 16) \_\_\_\_\_
- 17) \_\_\_\_\_
- 18) \_\_\_\_\_

WEBSITE #4: <http://learn.genetics.utah.edu/content/cloning/> Open the link and view each of the sections under "Cloning in Focus." For each section, answer the questions.

### **What is Cloning?**

19. Who is Dolly? \_\_\_\_\_
20. When a zygote divides into separate cells, it is called: \_\_\_\_\_
21. Somatic cells are also called \_\_\_\_\_.
22. In order to clone a gene, a gene is inserted into a \_\_\_\_\_.
23. In order to create an embryo from a somatic cell, the donor egg cell must have its \_\_\_\_\_ removed.

### **Click and Clone.**

24. List all the materials needed to clone a mouse.
25. Place the following steps in the box to the right in correct order.
26. There are two time gaps in the process of cloning. What are they? For example, what do you have to wait for?
27. What color will the cloned mouse be? \_\_\_\_\_  
What is the name of this mouse? \_\_\_\_\_

_____	Stimulate cell division
_____	Deliver baby
_____	Remove & discard nucleus from egg cell
_____	Isolate donor cells from egg donor & germ cell donor
_____	Transfer somatic cell nucleus into egg cell
_____	Implant embryo into surrogate mother

### **Why Clone?**

28. Why is cloning extinct animals problematic?

29. What are some reasons a person might want to clone a human?

30. Briefly describe in your own words, why CC the cat was not identical in color to Rainbow, even though she was a clone.

### **Cloning Myths**

31. What is "nature vs. nurture"?

### **Is it Cloning or Not?**

32. For each of the following scenarios, indicate YES (it is cloning) or NOT (it is not cloning).

\_\_\_\_\_ Sperm taken from a male goat is combined with a female's egg in a Petri dish. The resulting embryo is implanted into the female's uterus to develop.

\_\_\_\_\_ A sheep embryo, composed of 16 cells, is removed from the mother's uterus and separated into individual cells. Each cell is allowed to multiply, creating 16 separate embryos, which are then implanted in different female sheep to develop to maturity.

\_\_\_\_\_ A cow with many desirable traits is stimulated with hormones to produce a number of egg cells. Each of these eggs is fertilized and implanted into a surrogate mother.

\_\_\_\_\_ In vitro fertilization

\_\_\_\_\_ Cell nuclei from an extinct woolly mammoth are placed into enucleated cow cells.

**Website #5: <http://learn.genetics.utah.edu/content/cloning/cloningrisks/>**

### **What are the risks of cloning?**

33. What is one reason why cloning animals has such a high failure rate?

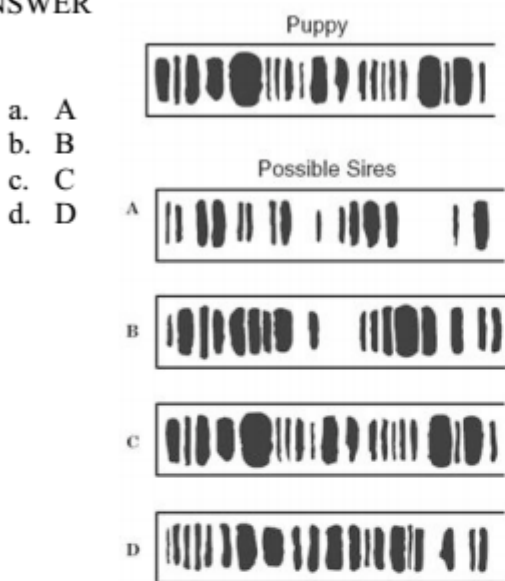
34. What is a telomere and how does it affect cloned animals?

### **Google Search: What are some ethical issues in cloning?**

35. Write a paragraph below on your thoughts and opinions about the ethical issues of cloning.

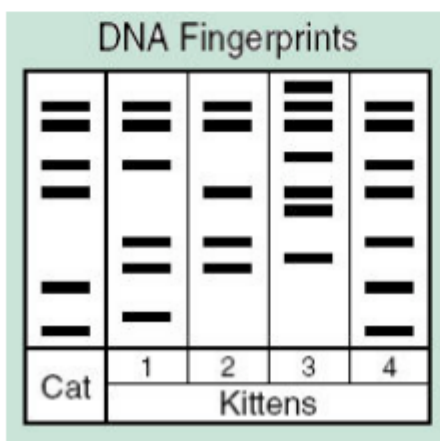
# DNA FINGERPRINTING PRACTICE

1. The DNA fingerprints were made from blood samples taken from a puppy and four possible sires of this puppy in an effort to determine the puppy's pedigree. According to this information, which sire was probably the father of this puppy? **CIRCLE YOUR ANSWER**

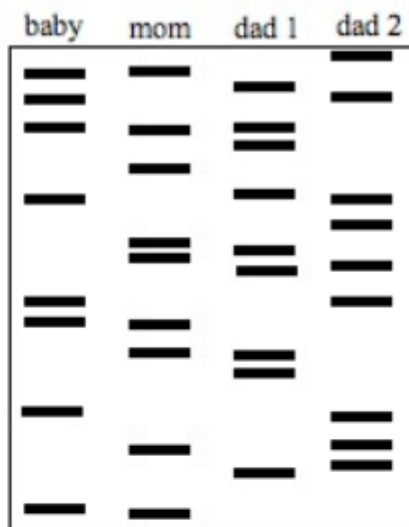


2. The picture shows a segment of DNA from a cat. Which of these is most likely the kitten of this cat? **CIRCLE YOUR ANSWER.**

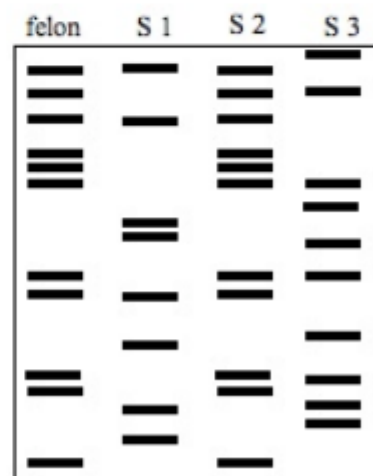
- a. 1
- b. 2
- c. 3
- d. 4



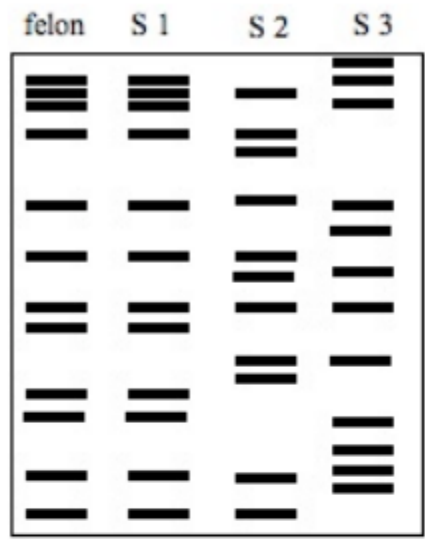
3. Mrs. Smith has a baby named Tyra. She believes one of two men can be the father of her child. A paternity test is done and the results are shown above. Which of the 2 men are baby Tyra's father? \_\_\_\_\_



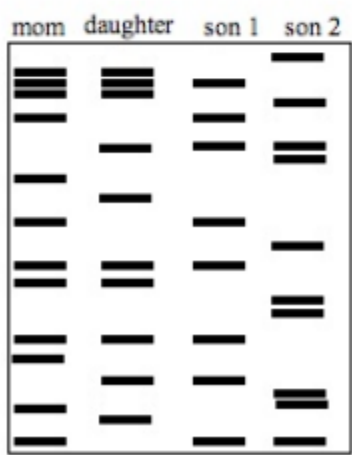
4. Lt. Russ is investigating a murder scene. The felon was scratched by his victim & some of his skin cells were found under the victim's fingernails. A DNA test was performed. Which of the suspects is the murderer? \_\_\_\_\_



5. Suzy was assaulted in an alley and is a victim of rape. The police collected a sample of sperm that was left at the crime scene and now have 3 suspects in custody. Which of the suspects raped Suzy? \_\_\_\_\_



6. The millionaire, Mr. Big, has just died. He has left behind a wife, daughter and a large inheritance. The news of his death has brought forth 2 men who claim to be the long lost son of Mr. & Mrs. Big. Before Mr. & Mrs. Big were married they had an illegitimate child and had placed him up for adoption. They had tried to find him after they became wealthy but had no luck in locating him. A DNA sample was taken from Mrs. Big, the Big daughter and the two men who claim to be the long lost son. Which, if any, of the men are telling the truth? \_\_\_\_\_



7. Mr. & Mrs. Jones just gave birth to fraternal twins- Bob and Jane. Unfortunately, the nurse has confused the Jones twins with 4 other babies. The doctors took samples of DNA from each of the babies and Mr. & Mrs. Jones. Which of the 6 children are Mr. & Mrs. Jones twins? \_\_\_\_\_

