

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) _____

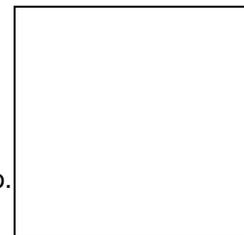
CLICK ON VIEW AND GO THROUGH THE INTERACTIVE

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?

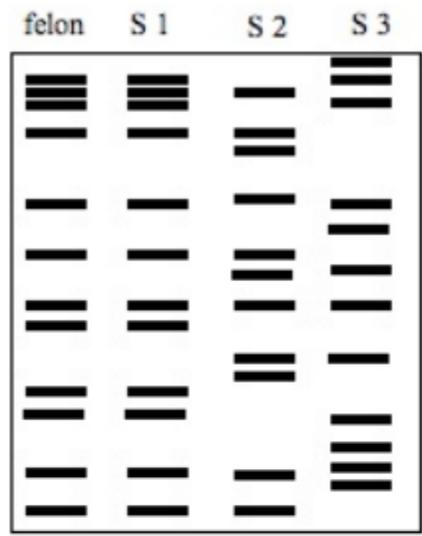
33. What is one reason why cloning animals has such a high failure rate?

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

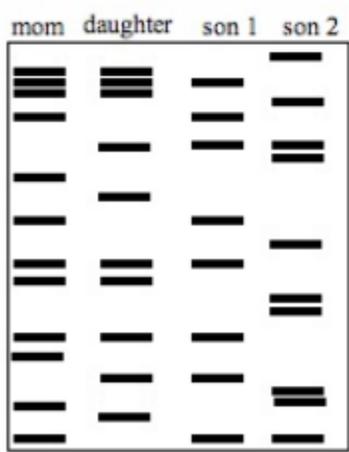
Google Search: What are some ethical issues in cloning?

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

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? _____

