

Name _____ Date _____ Period _____

Lab: Cloning

HONORS BIOLOGY: UNIT 7

DIRECTIONS: Log onto Learn.Genetics at <http://learn.genetics.utah.edu/> (Under the "Cell Biology" Menu, Click on "Cloning")

Browse the articles at the site to find the answers to the following questions.

What is Cloning?

1. Define Cloning:

2. What is the difference between natural twinning and artificial twinning?

3. What is SCNT?

4. To make Dolly the clone, they first isolated a cell from where?

5. They transferred the nucleus of this cell to where?

Click and Clone

6. List all the materials needed to clone a mouse.

7. Place the following steps in the correct order.

_____ Stimulate cell division

_____ Deliver baby

_____ Remove and discard the nucleus from the egg cell

_____ Isolate donor cells from egg donor and germ cell donor

_____ Transfer the somatic cell nucleus into the egg cell

_____ Implant embryo into a surrogate mother

8. Explain how the nucleus is removed from the donor egg:

9. What color will the cloned mouse be? _____. What is the name of this mouse? _____

The History of Cloning

10. What was the first organism ever cloned using artificial embryo twinning?

11. How did Hans Sermann separate cells from a salamander embryo?

12. What happened to the tadpoles that were cloned from more advanced embryos?

16. Where did John Gurdon obtain cells for his cloned frogs?

17. What was the first mammal embryo cloned?

18. What were the names of the two cloned calves?

19. Cultured sheep cells were used to create two lambs named _____

and _____.

20. What was the first mammal created using somatic cell nuclear transfer?

Where did the DNA come from for this clone?

21. Out of 29 primate clones attempted, how many were born? _____

22. How was the clone "Polly" different from the first sheep clone named "Dolly?"

23. What was the first extinct animal cloned?

Why Clone?

24. List four reasons given on the page for justifying cloning:

25. What is a stem cell?

26. Why did CC look different from Rainbow even though they were both clones?

27. What two things would you need to clone a dinosaur?

28. Why would a farmer want to clone livestock?

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

Is it Cloning or Not?

30. For each of the following scenarios, indicate **YES** (it is cloning) or **NO** (it is not cloning)

_____ Sperm taken from a mole 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.

Cloning Myths

31. Why is it impossible to make instant clones?

32. Why would Frankie #2 be different from Frankie #1?

33. Give an example of a natural clone:

34. Humans have been cloning _____ for thousands of years.

35. Why does cloning have such a high failure rate?