CLONING / Somatic Cell Nuclear Transplant Name _____

Click the link labeled "Cloning" on Mr. P's website or go to http://www.mrphome.net/mrp/Cloning.html

INTRODUCTION:
SCNT is short for Somatic Cell Nuclear Transplant. This procedure is used to produce cloned organisms.

PRE-LAB STEP 1: NATURAL REPRODUCTION:
To re-familiarize yourself with NATURAL REPRODUCTION, press **PLAY** and watch the animation in the **TOP HALF** of the animation box (one with "Mother" and "Father" sheep) entitled "NATURAL REPRDUCTION".
What "coloring patterns / markings" did the offspring sheep inherit from each parent? _____

PRE-LAB STEP 2: CLONING: SOMATIC CELL NUCLEAR TRANSPLANT (SCNT):
First, ONLY READ the blue captioned text to the left of the animations frame- DO NOT YET PRESS PLAY. Answer question 2 below

1. **ONLY CLICK "PLAY" OR "FWD" WHEN INSTRUCTED IN THE STEPS BELOW!**

Now you will work with the BOTTOM HALF of the animation box entitled "Somatic Cell Nuclear Transfer".

Three different sheep will participate in a cloning experiment each having a different role.

2. Sheep 1 shown in the animation is labeled "SOMATIC CELL DONOR". According to the blue text caption, what is a "SOMATIC" CELL? _____

What kind of coloring pattern (if any) does the "Somatic Cell Donor" sheep have? _____

3. **(PLAY)** Why is a SOMATIC cell described as DIPLOID? _____

4. **(Fwd)** What does the "culture . . . media" do to the donated somatic cell? _____

_____

5. **(Fwd)** Sheep 2 shown now is called an "EGG CELL DONOR". An egg cell has chromosomes, but is also filled with many necessary nutrients and substances – without these an embryo cannot begin to form and grow.

What is done to prepare the egg cell for the cloning? _____

How much genetic material does the egg cell now have? _____

6. **(Fwd)** What does the electrical pulse do? _____

After the somatic cell fuses with the egg cell, how many chromosomes does the egg cell have ? _____

According to what you learned from your reading/notes, how many chromosomes would a *normal* **egg cell** have? (a full or half set) _____

At this point can the cell shown be described as an "EGG" cell, or is it more like a "ZYGOTE" now? _____

Explain the answer you gave in the last question in terms of numbers of chromosomes shown. _____

_____

7. **(Fwd)** Sheep 3 is shown now whose job is to be the "SURROGATE MOTHER". A surrogate mother is one that grows and gives birth to a baby created from *different* parents. The foreign cell is implanted into the surrogate mother.

What kind of coloring pattern does the surrogate mother sheep have? _____ (The coloring pattern of sheep 2 and sheep 3 was *purposely* chosen to be the same. In this experiment, why is it important?)

8. **(Fwd)** This experiment used 3 FEMALES to produce a cloned offspring to avoid any possible link to a baby being produced through normal reproduction.

How can you tell using the picture that the somatic cell donor- Sheep 1 - has been *cloned*? _____

_____

CLONING A MOUSE "CLICK AND CLONE"; SCROLL DOWN AND DO THE "CLICK AND CLONE"

You will now follow a similar cloning procedure as was demonstrated on the other side using S.C.N.T.

1. Click "Mimi" to get started.

2. Before going any further, record the following:

What are the colors of the mice involved? (If you can't see all of them right now, refresh the webpage and start over at step 1 again. Mimi: _____ Megdo: _____ Momi: _____

Mouse 1: Mimi's role will be the _____ (Not sure? check other side)

Mouse 2: Megdo's role will be the _____

Mouse 3: Momi's role will be the _____

Based on the activity you did on the other side of this sheet, what important ingredient/material will come from the SOMATIC CELL? _____

Why will an EGG CELL be needed? (Not sure? Read the details on other side about the egg cell donor)

_____

_____

What will be the job of the SURROGATE MOTHER? _____

What color do you think the clone (baby mouse) will be in the end? _____

Continue then STOP when you see something called a BLUNT PIPETTE.
Preview Q's 3, 4 and 5 below and then proceed with the on-screen instructions.

3. What does the BLUNT PIPETTE do? _____

4. What does the SHARP PIPETTE do? _____

5. Why are they calling the egg cell "ENUCLEATED"? _____

Continue then STOP when you first can see BOTH CELLS through the microscope.
Preview Question 6 and 7 and then proceed with the on-screen instructions.

6. Where does the nucleus of the somatic cell end up? _____

7. During the timed waiting period, what happens to the "new" DNA? _____

Continue then STOP when you first can see the "DIVIDE-A-LOT" bottle.
Preview Question 8 and then proceed with the on-screen instructions.

8. What will the "DIVIDE-A-LOT" do to the cell? _____

Keep going until you "Deliver the baby mouse".

9. What color is the baby mouse? _____. Which mouse got "cloned" _____

10. Why do you think they use a completely different mouse (surrogate mother) to carry and deliver the clone?

_____

_____

11. In ONE word, what's the main way you can tell the difference between the original animal and its clone?

IT'S _____