

Name: _____ Date: _____ Period: _____

Now that you have learned about mitosis and meiosis, it is time to apply these ideas to **OUR** development from a single cell to many – forming an embryo. Please answer the questions below based on the *Differentiation and Growth* reading from class.

1. What is fertilization?

When the nucleus of a sperm merges with the nucleus of an egg.

2. What occurs within the first 30 hours after a zygote is formed?

The zygote divides into two new cells (daughter, same exact DNA) using the cell cycle (interphase & mitosis).

3. What is differentiation?

The process by which cells become different from each other and have special functions – cells become more specialized.

4. If a cell has become more specialized, what has it done?

The cell's job becomes more specific and so more of its genes are "turned off".

5. What type of cell is considered "undifferentiated" and why is this so remarkable?

Stem cells are so remarkable because they have the potential to become any type of cell.

6. The cells that make up your skin and your heart have the exact same DNA. Why do they look so different and have such different functions?

Those cells have become more specialized meaning that only a section of the DNA (or gene) is active, while other parts of the DNA are inactive.

7. Many times throughout the reading, genes are referred to as being “active” or “turned off”. What does this mean?

If a gene is active then that part of the DNA is being used; if turned off then that part of the DNA is not used.

Example: Genes that are “turned on” in nerve cells are “turned off” in muscle cells

8. How are genes turned on and off?

Regulator genes (a portion of the DNA) determines which genes are active and which are not.