SEX CELL FORMATION: WHY DON’T WE LOOK EXACTLY LIKE OUR SIBLINGS?

We will be looking at creating a model that involves cells (egg and sperm) and structures (chromosomes) that carry information from one generation to the next. Notice that the information isn’t passed on in a way that makes children identical to their parents or to any of their siblings. In this activity, you will build a model to explain how and why this occurs. To do this, you will observe and move two sets of chromosomes around. Humans normally have a total of 46 chromosomes, however you will be working with only 6 in this activity.

1. Observations of Dad’s set of chromosomes (List any similarities and differences that you see)
   Differences: Similarities:

2. Observations of Mom’s set of chromosomes (List any similarities and differences that you see)
   Differences: Similarities:

3. Now look at the two different sets of chromosomes. What difference do you see between the two sets?

4. Cut out the chromosomes. You should have 6 separate chromosomes for dad and 6 separate chromosomes for mom. Make sure that you do not cut off the labels!!
5. Recall that parents pass on information to their children in their egg and sperm cells. These combine in the process of fertilization. The information for making proteins is contained in structures called chromosomes. You will now use these paper chromosomes to make a fertilized egg. Use the separate diagram that illustrates the ovary cell, testis cell, egg, sperm and fertilized egg.

   a. Begin by placing all the chromosomes from the mom in the ovary cell and all the chromosomes from the dad in the testis cell. These cells contain the same chromosomal information as any other cell in the body. The cell in the ovary will be used to make egg cells, as the cell in the testis will produce sperm.

   b. **Your goal is to now move the chromosomes around to make egg and sperm, which will then be used in the process of fertilization to make a fertilized egg that can live.**

   c. Remember that when a cell divides or when two cells come together, no chromosomes are left behind. Also, don’t forget that the first cell of the baby needs to have the same number of chromosomes as the ovary and testes cell.

   d. Your teacher will need to approve whether you have successfully produced a fertilized egg that can live.

6. Jot down any steps you did to produce a fertilized egg that can live. Also, tell whether your baby is a boy or girl and how you know.

   **Step 1:**

   **Step 2:**

   **Step 3:**
7. AFTER you have made a fertilized egg that can live, sketch your procedure in the following diagram. Take care to include the correct label on each chromosomes.

Mom

Step 1:

ovary cell

Step 2:

eggs

Step 3:

fertilized egg (1st cell of baby)

Dad

Step 1:

testis cell

Step 2:

Divide

Step 3:

sperm

Why are the steps you followed important? In other words, what would happen if you didn’t follow those steps?
Move your chromosomes around on this paper.

Step 1:
Mom

ovary cell

Dad

testis cell

Divide

Step 2:

egg

sperm

Step 3:

fertilized egg

(1st cell of baby)