

Genetics
Comparing Mitosis & Meiosis

Name: _____
 Period: _____

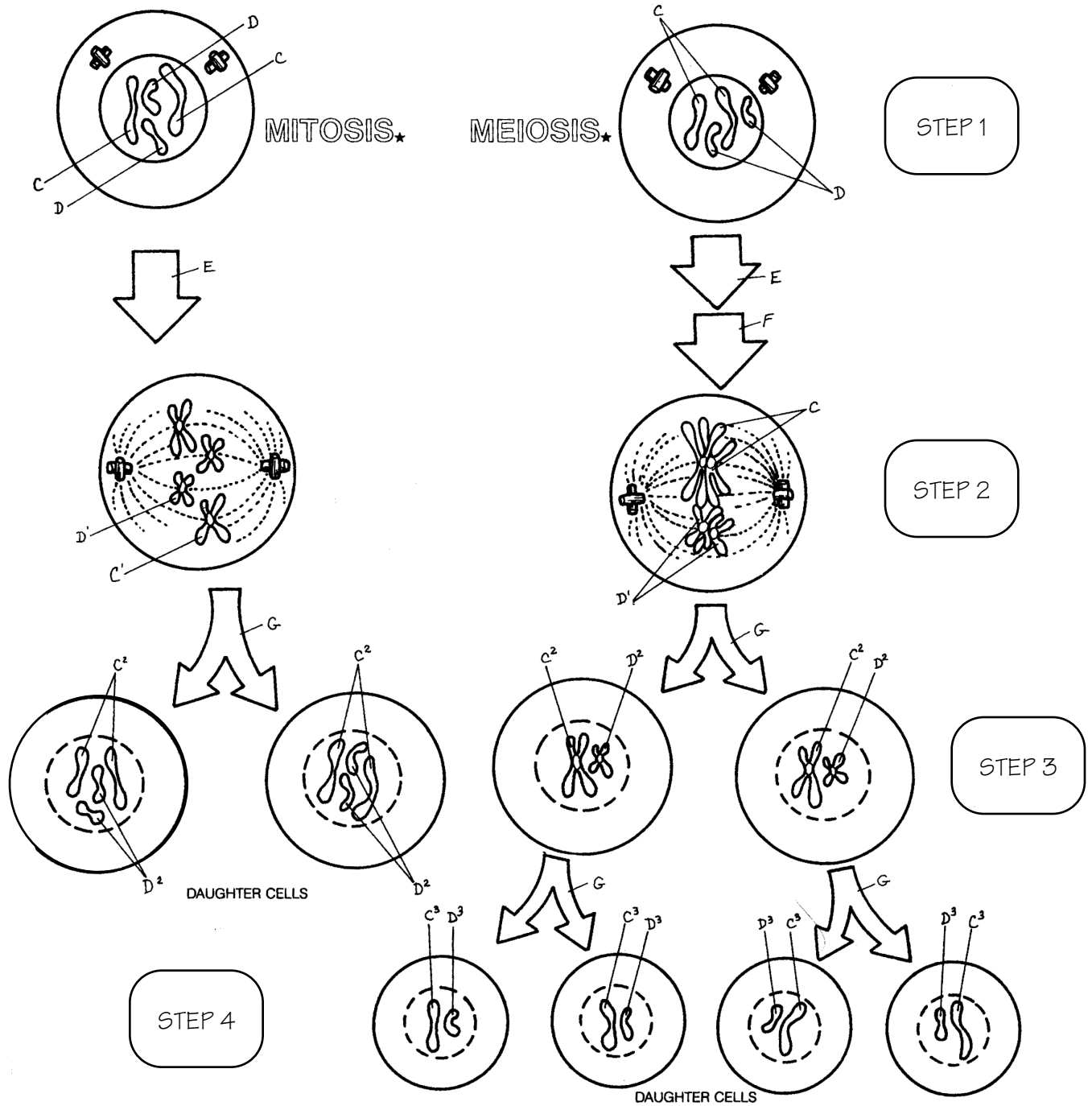


DIAGRAM KEY

○ Chromosome 1 - C, C ¹ , C ² , C ³	○ chromosomes copied - E
○ Chromosome 2 - D, D ¹ , D ² , D ³	○ chromosome pair up - F
	○ 1 cell divides into 2 cells - G

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Follow the instructions below to color-code the diagram and answer the questions. You can use Chapter 6, Section 3 of your book to help you. Use colored pencils.

The processes of mitosis and meiosis are similar, in that both processes create more cells than there were before. Mitosis is used to replace dead or damaged cells, and to help an organism grow larger. Meiosis is used to make sex cells, which are used to pass DNA from parents to offspring. In this exercise, you will be watching what happens to chromosomes during mitosis and meiosis.

- Look at the top of the diagram. Carefully color the words MITOSIS and MEIOSIS in black . These are the two processes you will be comparing.
- You will start by coloring in the chromosomes in both cells of STEP 1. Color chromosome 1 (C) red , and chromosome 2 (D) in blue .

What cell organelle contains these chromosomes? _____

- The chromosomes get copied for both processes. Color both E arrows between STEP 1 and STEP 2 orange .

What part of each cell must disappear between STEP 1 and STEP 2 to release the paired chromosomes? _____

- Before STEP 2, there is something different that happens in meiosis. The chromosomes line up in pairs, instead of getting ready to line up single file in the center of the cell. This extra step of pairing is indicated by the F arrow. Color the F arrow green .

- Color the chromosomes in STEP 2. Keep Chromosome 1 (C¹) red . Keep Chromosome 2 (D¹) blue .

During mitosis, the chromosomes line up _____.

In comparison, during meiosis, the chromosomes line up in _____.

- To get to STEP 3, the cells yank the genetic material (either single chromosomes or paired chromosomes) to the sides of the cell. Then, the cell membrane pinches off to form two new cells. This process is represented by the G arrow. Color the G arrows between STEP 2 and STEP 3 purple .

- Color the chromosomes in STEP 3. Keep Chromosome 1 (C²) red . Keep Chromosome 2 (D²) blue .

In Step 3, what does the dashed line around the chromosomes represent?

In Step 3, how are the chromosomes in meiosis different from the chromosomes in mitosis?

Which process is finished at the end of Step 3—mitosis or meiosis? _____

- Color the G arrows between STEP 3 and STEP 4 purple .
- Color the chromosomes in STEP 4. Keep Chromosome 1 (C³) red . Keep Chromosome 2 (D³) blue .

During mitosis, _____ daughter cells are formed. Each daughter cell formed by mitosis has _____ copies of each chromosome. During meiosis, _____ daughter cells are formed. Each daughter cell formed through meiosis has _____ copy of each chromosome. These are called sex cells. Male organisms produce sex cells called _____, and female organisms produce sex cells called _____. When two sex cells combine after _____, the resulting cells that make up the offspring now have _____ copies of each gene, instead of just having _____ copy of each gene.