**Name: Date: Period:**

**MITOSIS YARN LAB**

PURPOSE: The purpose of this lab is to help students gain an understanding of the changes that occur during cell division.

MATERIALS:

2 long pieces of green yarn

2 short pieces of yellow yarn

6 pieces of pipe cleaner (different lengths in sets of 2)

3 pieces of white yarn

Colored pencils

**Follow the instructions using the materials provided.**

Set-Up

First, you need to construct a cell. Using two long pieces of green yarn, make a large circle on your desk. This represents the cell membrane.

Next, use one smaller yellow piece of yarn to make your nucleus. This should be inside your cell.

Let’s Begin! ☺

1. Interphase

Directions: Your cell has gotten too big!! It needs to divide! Pick up one red, orange, and blue piece of pipe cleaner and drop them in a pile inside the cell nucleus. This pile of yarn represents chromatin, and all the information the cell needs to stay alive is stored here.

Draw your picture here: (use the colored pencils provided)

During the S phase, the cell duplicates its genetic material. Take the other pieces of your red, orange, and blue pipe cleaner and drop them on top of the other pieces already in the cell nucleus.

Now there is enough genetic information for both cells, but it needs to be separated. How is this going to happen?

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2. Prophase

First, the cell gets its genetic material into a more manageable state. Match the red, blue, and orange pipe cleaner pieces together, and twist them together loosely to form an X. You should have 3 X’s that are one color each. Each of these X’s represents a chromosome.

What connects the chromosomes in the middle?

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 The nuclear membrane disappears (remove yellow yarn) and the cell lays down spindle fibers. Lay the 3 long pieces of white yarn across the cell horizontally and then place the ends on either side together (it will end up looking somewhat like a football). This is the cells “guide” for making sure each new cell has the correct amount of genetic material. Scatter the chromosomes among the spindle fibers.

How does the cell use this guide?

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Draw your picture here: (use the colored pencils provided)

3. Metaphase

In order for the information to divide equally, the chromosomes must meet at the center of the cell. Move all of the chromosomes to the center of the cell along the spindle fibers, until they all line up.

Draw your picture here: (use the colored pencils provided)

Now how does the cell separate the sister chromatids?

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4. Anaphase

A chromatid is one arm of the chromosome, or one piece of pipe cleaner. Untwist the pairs of chromosomes so that there are 6 chromatids in the middle of the cell. When they are all untwisted, start to move one of each color pipe cleaner to the opposite sides of the cell. Bend the pipe cleaner pieces in a “V” shape to suggest that they are being pulled by the spindle fibers towards the sides of the cell.

Draw your picture here: (use the colored pencils provided)

5. Telophase

 Take away the spindle fibers (white yarn). Form a new nuclear membrane around each set of chromatids with the yellow yarn. This part of cell division is now complete.

Draw your picture here: (use the colored pencils provided)

What does the cell need to do in order to fully separate?

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Cytokinesis

The cell that just underwent mitosis is an animal cell. It will divide by pinching the cytoplasm. Join together each piece of green yarn so that they surround only one nucleus.

Draw your picture here: (use the colored pencils provided)

\*\*Clean-Up\*\* Make sure that all materials used are placed back in the bag in the state in which you found them