Name _____

Mitosis Model Project

Directions:

- You will create a model for each phase of Mitosis.
- Use your textbook and your notes to help you with the model.
- Use one piece of paper for each phase, beginning with Interphase and ending with Telophase.
- Your cell will have 3 chromosomes, each represented by a different color of yarn.
- The centromere will be represented by cutting circles out of colored paper.
- You will create centrioles out of colored paper and place them in the proper place for each phase.

- **Describe each phase and what is happening on the back of each piece of paper (you may want to do this before gluing the yarn to the paper)**

- Materials needed:
    - Yarn 9 pieces of each color (blue, green, and yellow)
    - 5 pieces of hard stock paper (one for each phase)
    - Colored paper- use to cut out the centromere and the centrioles when needed
    - Glue/Tape
    - Pencil/crayons/markers

Helpful Hints

Label the first page Interphase.

- Draw a circle to represent the cell (or cut off the edges of the paper to make a circle).
- Draw a small circle in the center to represent a nucleus.
- Label the cell membrane, the nuclear membrane and the chromatin. (you will need one piece of each color of yarn to represent the chromatin in this phase)
- Label the centrioloes. You can cut these out of colored paper or draw them on your paper.

Label the second page Prophase

- Draw a cell and use small pieces of yarn to represent the chromosomes. Your cell will have 3 chromosomes. Remember that the chromosomes have been copied by now. One is represented by the blue yarn, one by the green yarn, and one by the yellow yarn. You will need 2 pieces of each for this phase.
- Glue the yarn in place, keeping the pairs together.
- Use small circles of construction paper to represent the centromeres, which are attached to the chromosome pairs.
- The nucleus has disappeared during this phase and the picture should reflect this idea.
- You may use small rectangles cut from construction paper to represent the centrioles or draw them by hand.
- Draw the spindle fibers with a colored pencil.
- Label the chromosomes, centromeres, centrioles, and the cell membrane.

Label the third page Metaphase

- Draw the cell and use double pieces of yarn to represent the double-stranded chromosomes as in prophase. These chromosomes are lined up along the middle of the cell and glued in place.
- Glue the two objects used to represent the centrioles at opposite ends of the cell.
- Use a colored pencil to draw the spindle fibers.
- Label the cell membrane, chromosomes, spindle fibers, and the centrioles in this picture, as they are the key organelles in this phase.

Label the fourth page Anaphase

- This cell model should reflect the chromosomes separating and moving to opposite ends of the cell. The spindle fibers are shorter and the three double chromosomes are now being pulled away from each other to form a new cell, identical to the first. Glue all pieces into place and label all parts.
- Label the cell membrane, chromosmes, spindle fibers, and the centrioles.

Label the fifth page Telophase

- In the final step of mitosis, the spindle fibers have disappeared along with the centrioles. Draw the cell membrane.
- Draw a nuclear membrane and add the chromosomes that have separated to opposite sides of the cell.
- Draw a line to indicate the two new cells that are beginning to form.
- Label the cell membrane, chromosmes, spindle fibers, nuclear membrane, and the centrioles.

Remember to write a description of each phase and what is occurring on the back of each model that you made!!!

Final Conclusion Questions:

1. What is the result after Mitosis occurs?

2. If four cells went through Mitosis at the same time how many daughter cells would be formed? Explain your answer.

Mitosis Model Rubric

CATEGORY	**5**	**4**	**3**	**2**	**1**
Accuracy of Phases of Mitosis	All 5 accurate phases of Mitosis are displayed.	4 accurate phases of Mitosis are displayed.	3 accurate phases of Mitosis are displayed.	2 accurate phases of Mitosis are displayed.	Only 1 or no accurate phases of Mitosis are displayed.
Display – Neatness	Phases are all clear and displayed neatly.	4 phases are clear and are neatly displayed.	3 phases are clear and displayed neatly.	2 Phases are clear and images are displayed neatly.	Phases are not clear and images are not displayed neatly.
Labels	All items listed in the directions for each phase are labeled.	1 or 2 items listed in the directions are not labeled.	3 or 4 items listed in the directions are not labeled.	5 or 6 items listed in the directions are not labeled.	More than 6 items are not labeled.
Required Elements	Includes all required elements as well as written description of all phases.	Most elements are included as well as all written descriptions.	Most required elements are included but 2 written descriptions are missing.	A few required elements were missing and less than 3 written descriptions were included.	Several required elements were missing and less than 2 written descriptions were included.
Grammar and Spelling	There are no grammatical or spelling mistakes.	There is 1 grammatical or spelling mistake.	There are 2 grammatical or spelling mistakes.	There are 3 grammatical or spelling mistakes.	There are more than 3 grammatical or spelling mistakes.