Name: _____ Date: _____ Block: _____

Science 9: Modelling Mitosis and Meiosis

Background: *Drosophila melanogaster* (fruit fly) is a common organism used in biology research. It has a simple genome consisting of 8 chromosomes. Its body cells are diploid and its gametes are haploid.

Group Project: Your task is to model the processes of mitosis *and* meiosis in a fruit fly (see pages 58-59 of your textbook). Your model must incorporate the following:

- Which cells undergo this type of cell division? What is the purpose/goal of this type of cell division?
- Structures:
  - Spindle fibers
  - Nuclear envelope
  - Cell membrane
  - DNA: chromosomes, chromatin, centromeres; duplicated vs unduplicated chromosomes; homologous chromosomes
  - Optional: centrioles
- Optional: supplemental explanation. If there are any parts of your model that could be misinterpreted (e.g. a subtle joke in a rap, or a creative element in a video), please include a written explanation with your project.

Individual Response: In addition to your model, you will be submitting your individual responses to questions #1-6 on tb pg 59. (Although you are free to discuss these questions with others, your response must be in your own words.)

	Extending	Proficient	Developing	Emerging
Group Project	☐ Project goes above and beyond minimum requirements (e.g. extra research, entertainment value, creativity, attention to detail, effort). ☐ Model demonstrates a complete and nuanced understanding of mitosis and meiosis. ☐ Model clearly shows the similarities and differences between mitosis and meiosis. Differences in individual stages are discussed in relation to the overall goals of that type of cell division.* ☐ Model is cohesive and easy to interpret; attention has been paid towards streamlining appearance and/or presentation.	☐ The overall goals of mitosis vs meiosis are discussed. ☐ All required components included. Model demonstrates a complete and accurate understanding of mitosis and meiosis. ☐ Model is cohesive and easy to interpret.	☐ The overall goals of mitosis and meiosis are discussed briefly. ☐ The project has all of the required components. Some errors or gaps in conceptual understanding are evident. Model shows a simplistic understanding of mitosis and meiosis. ☐ Model is disorganized and/or difficult to interpret.	☐ The project is missing required information and components. Major gaps in conceptual understandin g are evident.
Individual	☐ Answers have been completed thoughtfully and with attention to detail. A complete and nuanced understanding of mitosis and meiosis is shown. ☐ Answers have been proofread and are error-free.	☐ Answers are complete and correct. A complete and accurate understanding of mitosis and meiosis is shown. ☐ Answers have been proofread and are mostly error-free.	☐ Answers are complete, but some errors or gaps in conceptual understanding are evident. A simplistic understanding of mitosis and meiosis is shown. ☐ Answers are disorganized; errors may obscure meaning.	☐ Answers are incomplete.

*The purpose of mitosis and meiosis is different. Explicitly explain how differences in the stages of mitosis and meiosis give rise to the desired end products. (i.e. How is it that in meiosis you end up with 4 haploid cells? How is it that in mitosis you end up with 2 diploid cells?)