

Cell Cycle Cookies

Lesson Topic The cell cycle

RIEL Biology Element

Attention to Language

Time Required

Two to three class periods

Standards Addressed

 SC.912.L.16.14 Describe the cell cycle, including the process of mitosis. Explain the role of mitosis in the formation of new cells and its importance in maintaining chromosome number during asexual reproduction.

Science and Engineering Practice

- Obtaining, evaluating and communicating information
- Developing and or using models

Content Learning Objectives

 Students will be able to describe what is happening inside the cell, including to the chromosomes, during the cell cycle.

Lesson Summary

Students will use cookies as cell models. They will work together to design a cookie for each phase of the cell cycle (interphase and the phases of mitosis).

Students will collaborate in same-language groups, with multilingual dictionaries, to describe what is happening in each phase of the cell cycle using both their home language and English. As we describe what happens in each phase, we will use vocabulary terms such as chromosome, middle, spindle fibers, apart, cytokinesis etc. Students will be asked what the word is in their home language and write it on the board. In some cases, the words are very similar in sound and have a spelling difference.

Students discuss what is happening in each phase of the cell cycle and write a summary, as well as draw an image. When this is correct, they then develop a plan to make a model of interphase and each phase of mitosis in cookies. They need to use the items I have provided and decide as a group, what will represent the cell membrane, chromosomes, spindle fibers, centrioles. They then come up with a plan as to who will decorate each phase and how to go about it so that their cookies are consistent with one another. When they are done, they each talk about their cookie, in order, and then eat!

Materials

- Cell cycle worksheet
- Writing utensil
- Cookies sugar cookies are great for a small group but cremefilled cookies where they top part of the cookie has been removed will also work
- Frosting if using sugar cookies
- Gel icing for cakes
- Variety of sprinkles





Before the Activity

Make a list of student groups of 5, making sure to put students that are multilingual together. These 5 students will represent interphase and the phases of mitosis. If you need to make them bigger, you can add a student or 2 and they can represent the daughter cells. Students are given an overview as to the purpose of mitosis and a breakdown in images of each phase of mitosis.

Lesson Activities

- 1. Introduction. Ask students if they know how often skin cells die and are replaced. After some discussion, ask how are those skin cells are replaced. After discussion, ask, how does a baby or a child grow? This is student-led without any information given to them by the teacher.
- 2. Watch. <u>Mitosis: The Amazing Cell Process that Uses Division</u> to Multiply
- **3. Discuss.** Return to the discussion of skin cell and growth and ask the same questions. Guide them through the process and purpose of cell division.
- 4. Student Groups and Explaining the Cell Cycle. Give students their handout and put them in their groups. Have them bring their tables close together. Using their text and multilingual dictionaries, ask them to look through each phase for new science terms and definitions.
- **5. Language.** Ask the students to raise hands say these new terms and write them on the board. For each new term, ask:
 - a. Is there a word for it in their home language?
 Students will Write that on the board as well.
 Students will come up with terms like chromosomes, spindle fibers, nucleus.
 - As we walk through each phase, what's happening?
 Ask how we could describe that in their home language and have them write those out as well.
- 6. Collaborate. Once they have helped guide you through each phase in their home languages and they are written, have them work in groups to summarize what is happening in each phase and draw it out on their worksheet.

Teacher Notes

- As students discuss the phases of mitosis, ask what certain words are in their home language and have them include that in their writing.
- For example, they may point out that the nuclear envelope disappears – what is disappear in their home language? Or that the chromosomes line up in the middle in metaphase. What is middle in their home language? In anaphase chromosomes are pulled apart to the poles of the cell. What is for apart in their home language?







Lesson Activities

- 7. Students Make Edible Models. Once students have completed their worksheet and it is corrected and agreed upon, they are ready to make their cell models. Each student needs a cookie, they cannot eat until they have completed their task and have taken pictures of their work.
- 8. Collaborate to create a model. As a group, they decide who will make each phase in the cell cycle, including interphase. Before they start, they need to look over the supplies you have provided and determine what will each represent and document this. Once they have written out this part, they may get their supplies and start making their model.
- **9.** Share final model. When the whole group is finished, they line up their cookies in order, take a picture and explain their work to the teacher. Then they can eat the cookies.
- 10. End of class/next day. Using an image from the day before, call on students to describe what is happening in each phase. Review the overall purpose of the cell cycle. Then ask students, how does the cell know when it is time to reproduce? And what happens if something goes wrong with this process. This leads to a deeper look at interphase and cancer- a disease of the cell cycle.

Teacher Notes

- When creating the model and recording which materials will represent what, students may need guidance.
- The teacher can provide examples such as: the nuclear envelope could be drawn with red gel icing, the chromosomes are the elongated blue sprinkles, the centromeres are little sprinkles, the spindle fibers are black gel icing, etc.







Name: _____

Date:_____



Student Cell Cycle Chart

Phase		Diagram	Main Changes	Model Ingredients
Interphase	G1			
	S			
	G2			
Mitosis	Prophase			
	Metaphase			
	Anaphase			
	Telophase			
Cytokinesis				



