

TITLE OF LESSON

Biology Unit 1 Lesson 22 – Meiosis, Comparison of Mitosis and Meiosis, and Oogenesis and Spermatogenesis
During division how does a cell divide up what's inside and outside?

TIME ESTIMATE FOR THIS LESSON

One class period

ALIGNMENT WITH STANDARDS

California – Biol CB 1; G2

MATERIALS

Materials for making flash cards such as index cards, pens or markers
Teacher's Notes Lesson 22 – Teacher Page

LESSON OBJECTIVES

- To understand the process of meiosis and its role in sexual reproduction
 - To understand the stages of meiosis
 - To compare the similarities and differences between mitosis and meiosis
 - To learn about how gametes are formed
-

FOCUS AND MOTIVATE STUDENTS – WARM-UP ACTIVITY

- 1) Homework Check – Initial all homework from last night. Pass back all graded assignments.
 - 2) **Agenda** – Have students copy the agenda you posted.
 - 3) **Brainstorm**: Write the following question on the board: Do you think all of your cells are in the same stage at the same time, i.e. are all your cells in interphase or mitosis at the same time? Why or why not? Which of your cells are undergoing meiosis and which are undergoing mitosis? Have students work in their groups for five minutes to Brainstorm a list of their viewpoints and provide evidence that supports their viewpoints. At the end of 5 minutes, call time.
 - 4) Present – Call on one student from each group to present their brainstorm.
 - 5) Discuss – When all groups have finished presenting, discuss with them whether or not they were correct. In real life, cells are all at different stages, some are always in interphase, others divide every few hours, others every few days, others every few years and some never divide once they reach full size. The only cells that undergo meiosis are the gamete cells; all others only divide mitotically. Make sure the students jot down the questions and the key points in their notebooks.
-

ACTIVITIES – INDIVIDUAL AND GROUP

1. Flash – Give the students five minutes to study the flash cards they made yesterday (mitosis and cytoplasmic division) and to review the ones on cell cycle and chromosomes (remember they were supposed to study them at home last night). Then have them pair up. Assign each partner a letter as before. Tell them that first all the Bs will be flashing the As. The correct answers will be put in one pile and the incorrect in another. Tell them they have 5 minutes to get through all of their cards. Go. At the end of five minutes, call time. Record correct answers in the grade book when finished. Next have all the A's flash the B's. Give them 5 minutes. At the end of 5 minutes, call time. Record the number correct in your grade book. The goal is to increase the number correct each time they flash.
2. Lecture – Lecture about meiosis (see material in **Teacher's Notes Lesson 22**) while the students take notes and the selected notetaker takes notes at the overhead.

3. Display Images – Have images of the stages of meiosis for the class. Use those in your textbooks or from the biology web site: <http://gened.emc.maricopa.edu/Bio/BIO181/BIOBK/BioBookmeiosis.html> to complement your lecture.
4. Similarities and Differences – Have the students meet in their assigned groups to make a list of the similarities and differences between mitosis and meiosis. Give them 10 minutes to write up their lists. A volunteer from each group will go to the board and write up one of their findings. The students will copy down this information for their folders. The teacher will make sure that they have found all the similarities and differences. They are listed here:

Comparison of mitosis and meiosis

Mitosis produces exact copies of the parent cell

Meiosis produces cells with half the chromosome number as the parental cell

Mitosis and meiosis II are similar

Meiosis I during prophase I is when crossing over occurs, leading to genetic recombination and the 2 homologous chromosomes are attached and move together to one pole

5. Lecture 2 – Lecture about oogenesis and spermatogenesis (see material in **Teacher's Notes Lesson 22**) while the students take notes and the selected notetaker takes notes at the overhead. Have images to present from your textbook or from the biology web site:
<http://gened.emc.maricopa.edu/Bio/BIO181/BIOBK/BioBookmeiosis.html>
When you have finished your lecture/discussion, **Applaud/Critique** your notetaker.
6. Benefits and Drawbacks – Tell the students to get into their assigned groups. Ask them why sexual reproduction is important. Why not just have asexual reproduction? What are the benefits? What are the drawbacks? Give them 5 minutes to write down their ideas and then report them back to the class.

Answers: Essentially sexual reproduction provides variation in the offspring. It is a mixing of the genes from the mother and the father. It's important because it allows for changes in the offspring that might give it an advantage over other offspring or be able to tolerate changes that occur in the world.

7. Homework Review – Remind students of their homework. Also, tomorrow is a computer lab day. Tell students to go directly to the lab. You will meet them there.
-

HOMEWORK

- 1) Read Starr's textbook *Biology Concepts and Applications*, chapter 9, pp. 138-150. Ensure that the students read about meiosis and its two divisions, meiosis I and II, all the stages in meiosis I and II, crossing over, oogenesis and spermatogenesis.
 - 2) Write up all the key points from the reading. Due tomorrow when you walk in the door.
 - 3) Finish your flash cards.
-

GROUP ROLES

The recorder – The recorder will take notes on the main points of the discussion to be placed in the class folder, and will write down the comparisons between mitosis and meiosis for the class folder, the answers to the warm-up questions, and the answers to the activity questions. All students are recorders today.

DOCUMENTATION FOR PORTFOLIO

Lab Report #1