

Teacher directions for physical quiz on the cell cycle.

Objective

The students will work cooperatively with a group to “walk” the chromonoodles through the phases of mitosis and understand that at the end of mitosis and cytokinesis there are two identical, diploid cells. These cells are used by the body for growth, repair, and development of individuals. The students will also take a paper quiz to reinforce the material learned during the physical quiz.

Vocabulary

- cell cycle
- mitosis
- cytokinesis
- prophase
- metaphase
- anaphase
- telophase
- interphase
- haploid
- diploid
- chromosome
- gene
- allele
- chromatids
- sister chromatids
- homologous chromosomes
- centromere
- spindles
- G₁
- G₂
- G₃

Procedure

1. The class should be divided into small groups of five or six students.
2. The groups should be given time to write and rehearse their mitosis “play.” Only the narrator is allowed to talk.
3. They should be given the following directions, along with the student handout:

You must act out the phases of the cell cycle using the chromonoodles, with special attention given to mitosis and cytokinesis. Only one person—the narrator—may talk during your play. They may read from a script that you hand in upon completion of your play. You may make signs to help identify what is occurring. Other props can also be used. Everyone in your group must participate equally. Your group grade will be based on the rubric at the bottom of your handout.

4. Depending on the level of the students, devote one or two class periods for students to practice and get organized.
5. When it is time to perform, each group should go in front of the class to act out their play.
6. Class discussion should follow each group, allowing the other students to praise and critique. The teacher can point out things that were done well and things that should have been changed. This allows for whole class learning.
7. After each group has performed, a traditional paper quiz (see example below) should be given as part of each individual student's grade. This helps to allow for differences in what was learned in each group. That grade can be added to the group grade from the rubric.

Possible questions for paper quiz

1. How many chromosomes did the original cell begin with?
2. What happened during G_1 ?
3. What happened during S?
4. Why does DNA replication have to occur?
5. What happened during prophase?
6. What happened during metaphase?
7. What happened during anaphase?
8. What happened during telophase?
9. What happened during cytokinesis?
10. Draw one chromosome.
11. Draw sister chromatids.
12. Draw homologous chromosomes.
13. Where is the centromere located?
14. What is the purpose of the spindles?
15. What is the end result of one turn of the cell cycle?