carolina Quicktips®

ChromoSock® Meiosis

In this activity, you will use custom-sewn socks to model the behavior of chromosomes during meiosis. You will also simulate reduction division and relate this to maintenance of chromosome number during sexual reproduction; and model a meiotic event with a nondisjunction that results in gametes with changes in chromosome number, relating these changes to monosomy and trisomy.

The activity supports 3-dimensional learning and builds toward the following:

- NGSS Scientific and Engineering Practice: Developing and Using Models
- NGSS Core Idea: Life Science 3: Heredity: Inheritance and Variation of Traits

Materials Required

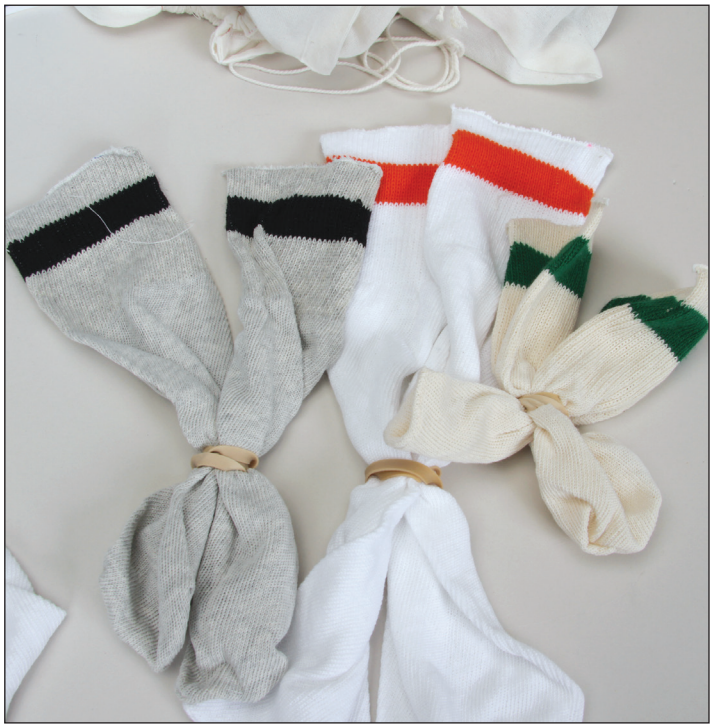
ChromoSock® Meiosis Classroom Kit (214810)
Modeling Mendel's Law Classroom Kit (214812)

Activity Procedure

1. Obtain a bag containing 1 set of socks.
2. Arrange the socks in pairs.
3. Obtain a second bag of socks and model replication using the socks from the first bag. Use rubber bands, which simulate centromere connections between replicated chromosomes, to connect the replicated socks.
4. Use the socks to model meiosis I.
5. Discuss the products of meiosis I.
6. Model meiosis II.
7. Discuss the end products of meiosis II.
8. Nondisjunction occurs when chromosomes fail to separate properly during meiosis. Nondisjunction events result in gametes with either too few or too many chromosomes. Repeat the process of meiosis modeling a nondisjunction event. Note the products of meiosis. **Note:** *Nondisjunction may occur during meiosis I or meiosis II and results in gametes with varying chromosome numbers.*

Results/Summary

The purpose of meiosis is to reduce by half the number of chromosomes present in a mature egg or sperm. This reduction in chromosome number occurs during meiosis I. Four gametes are formed as the end product of meiosis. Sometimes chromosomes fail to separate during meiosis—a nondisjunction event. This results in gametes with either too few or too many chromosomes.



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Carolina is honored to collaborate with the HudsonAlpha Institute for Biotechnology. A nonprofit research institute located in Huntsville, AL, HudsonAlpha engages the power of biotechnology to improve life. Its 3-fold mission is genomic research, economic development, and educational outreach. For more information about HudsonAlpha, go to **www.hudsonalpha.org**.

Additional Information

Visit **www.youtube.com/watch?v=Ds-6ouGLb9o** to view the video "Sockumentary: They come in pairs." View more information, content links, and products related to this activity at **www.carolina.com/takeaways**.

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