Teacher's Guide for "The Cell Division Song"

CT State Standards	National Science Standards
C. 25 Explain the similarities and differences in cell division in somatic and germ cells	**<u>Structure and Function in Living Systems</u>** **Cells carry on the many functions needed to sustain life. They grow and divide, thereby producing more cells.**

I. Vocabulary Covered in "The Cell Division Song"

A. Mitosis Vocabulary

1. Prophase – Stage of mitosis when the chromosomes become visible**,** the nucleolus disappears, the spindles form, and the nuclear envelope disappears
2. Metaphase – Chromosomes line up in the middle of the cell plate and attach to the spindles
3. Anaphase – chromosomes move to opposite ends of the cell
4. Telophase – chromosomes assemble at opposite poles and nuclear envelopes reappear.
5. Cytokinesis – process where cytoplasm finally divides during mitosis.

B. General Vocabulary

6. Gametes – sex cells (sperm or egg)
7. Chromosomes – an organized structure of DNA that contains genes
8. Somatic Cells (nonsex cells – any cell other than sperm or egg)
9. Mitosis – process utilized by nonsex cells to divide
10. Meiosis – process utilized by sex cells to divide
11. Germ cells - sex cells (sperm and egg)

II. Understanding Cell Division Concepts within the song

A. Stages of Mitosis

1. Before mitosis begins, interphase occurs (the stage most cells are in) where cells carry on their normal activities. When mitosis occurs there are series of steps that happen in order for the cell to divide. The refrain of the song serves as a learning device to allow students to learn the names of these stages of mitosis in order: prophase, metaphase, anaphase, telophase, and cytokinesis.
2. This would be a good introduction to those phases and then the teacher could go into discussion about what occurs in each stage (brief summary provided in the vocabulary section above).

B. Somatic cells and Gametes (sex cells aka germ cells)

Within the song's first verse, the differences between somatic and germ cells are discussed.

1. Sex cells (aka gametes or germ cells) are sperm and egg. Each carries 23 chromosomes that join together to create us
2. Somatic cells are any other cell in the body other than sperm or egg. Each contains 46 chromosomes and they divide to promote growth or to replace old cells.

C. Mitosis versus Meiosis

The second verse of the song discusses mitosis versus meiosis which are often confused by students.

1. Mitosis – occurs only in somatic cells and the outcome is 2 identical cells with 46 chromosomes
2. Meiosis- occurs only in germ cells (sperm and egg) and the outcome is 4 cells each with 23 chromosomes.

Student Worksheet for "The Cell Division Song"

Part I. Fill in each sentence with the correct definition.

1. The stage of mitosis where the cytoplasm divides and forms 2 cells _____
2. The stage of mitosis where the nuclear envelopes reappear and the chromosomes assemble at the opposite ends of the cells _____
3. The stage of mitosis where the chromosomes line up in the middle of the cell _____
4. The stage of mitosis where the nuclear envelopes disappear, the spindles form, and the chromosomes become visible _____
5. The stage of mitosis where the chromosomes move to opposite ends of the cell. _____

Part II. Match the following terms with their correct definitions

_____1. Gametes	A. Non-sex cells
_____2. Chromosomes	B. Sperm and egg cells
_____3. Meiosis	C. Process where non-sex cells divide
_____4. Mitosis	D. Organized structures of DNA with genes
_____5. Somatic cells	E. Process where sex cells divide

Part III. Checking for Understanding: Answer each questions as completely as you can with detailed sentences.

1. Discuss the differences between mitosis and meiosis. In your answer include:
   a. What types of cells undergo each process
   b. How many cells are made at the end of each
   c. How many chromosomes are found in the cells made at the end of each process

_____
_____
_____
_____
_____
_____

2. Draw and label the different stages of mitosis. Under each picture, briefly describe what is occurring.