

**Skills and Strategies**

- Planning and Conducting
- Processing and Analyzing Data
- Evaluating
- Communicating

**Safety**

- Take care when using sharp utensils, such as scissors. Report any accidental cuts to your teacher.

**What You Need**

Suggested materials:

- pool noodles (to represent chromosomes in a play)
- crafts supplies such as
  - clay
  - pipe cleaners
  - string
  - glue
  - coloured paper
  - markers
  - scissors
  - yarn

**Modelling Mitosis and Meiosis**

During cell reproduction, changes occur to the chromosomes. These are necessary for the new cells to have the correct genetic material. In this investigation, you will develop models that show what happens to the chromosomes of a parent cell with four chromosomes when daughter cells form by mitosis and by meiosis.

**Question**

How can you model the movement of chromosomes in meiosis and mitosis?

**Procedure**

1. Your teacher will assign groups. As a group, make a list of the important features of mitosis and meiosis that you will need to show in your models.
  - What features will you need to include to be able to show what happens to the chromosomes?
  - How can your models show important differences between mitosis and meiosis?
2. Based on your list in step 1, develop a plan for how to make models to represent chromosome movement in mitosis and meiosis.
 

Be creative—for example, your group could build a clay model, create a computer simulation, or perform a play. Make a list of your ideas, and decide on the type of model you will use.
3. Make a list of the materials you will need.
4. Have your teacher approve your plan and materials list before you start to develop your models.
5. Carry out your plan.
6. As a class, display your models. Any group that has chosen to do a play should perform the play for the class.

## Analyze and Interpret

1. What is the difference between chromosomes in cells at the beginning and end of mitosis? at the beginning and end of meiosis?
2. How did your models represent the similarities between mitosis and meiosis? How did they represent differences?
3. Compare your models with what you saw from other groups. Would you change something about your models after seeing the others? Why or why not?

## Conclude and Communicate

4. How did this modelling investigation help you better understand mitosis, meiosis, and the similarities and differences between the two processes?
5. In what ways is meiosis suited to the production of gametes, but not to the production of identical daughter cells? How is mitosis better suited for this purpose? Explain your answer using your model as a reference.
6. What are some limitations of your models?

