

Section 6: Cytokinesis and Daughter Cells

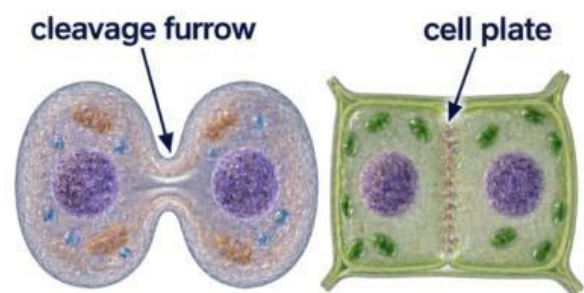
Learning Objective: Compare cytokinesis mechanisms in animal cells and plant cells, and calculate resulting chromosome counts in somatic daughter cells.

Key Vocabulary: cytokinesis, cleavage furrow, cell plate, daughter cells, somatic cell, diploid, cell wall.

Cytokinesis is the physical division of the parent cell's cytoplasm and organelles into two distinct daughter cells. While mitosis divides the genetic contents of the nucleus, cytokinesis divides the rest of the cell.

In **animal cells**, flexible cell membranes pinch inward along the equator forming a **cleavage furrow**. Microfilaments tighten like a drawstring until the cell pinches completely into two.

In **plant cells**, the rigid cellulose cell wall cannot pinch inward. Instead, vesicles filled with cell wall materials line up along the middle to form a **cell plate**, which expands outward until a new cell wall separates the daughter cells.



1. Complete the comparison table below contrasting cytokinesis in animal versus plant cells:

Feature	Animal Cell Cytokinesis	Plant Cell Cytokinesis
Dividing Structure Formed		

2. Somatic cells divide by mitosis to produce two daughter cells that have exactly the same number of chromosomes as the parent cell. Fill in the missing values in the table below:

Organism	Parent Cell Chromosomes (G1)	Number of Daughter Cells Produced	Chromosomes per Daughter Cell
Human (<i>Homo sapiens</i>)	46		
Fruit Fly (<i>Drosophila</i>)	8		

Dog (<i>Canis lupus</i>)	78		
Corn (<i>Zea mays</i>)	20		

3. Analyze the genetic continuity between parent and daughter cells:

a) Are the two daughter cells produced at the end of cytokinesis genetically identical, genetically diverse, or unrelated? Explain why.
