



Lesson Overview

10.1 Cell Growth, Division,
and Reproduction

Information “Overload”

Living cells store information in DNA that is used to build molecules needed for cell growth.

As cell size increases, demands on that information increase.

If the cell gets too big, the DNA would not be able to serve the needs of the growing cell.

Exchanging Materials

Nutrients enter and waste leaves a cell through the cell membrane.

The rate at which this exchange occurs depends on the surface area of a cell.

The rate at which nutrients are used and waste products are produced depends on the cell's volume.

If a cell gets too large, the surface area of the membrane is not large enough to exchange nutrients and waste quickly enough.

Division of the Cell

Before a cell grows too large, it divides into two new “daughter” cells in a process called **cell division**.

Before cell division, the cell copies all of its DNA.

Each daughter cell receives a complete set of DNA.

Cell division reduces cell volume and results in a better surface area to volume ratio for each daughter cell.

In multicellular organisms, cell division leads to growth, body repair and maintenance.

In single-celled organisms, cell division is a form of reproduction.

Asexual reproduction involves a single parent producing an offspring.

- offspring usually identical to parent (clones)
- produce many offspring from 1 cell.

Both prokaryotic and eukaryotic single-celled organisms and many multicellular organisms can reproduce asexually.

sexual reproduction - offspring produced by the fusion of two sex cells
– one sex cell from each of two parents.

offspring inherit some genes from both parents.

Most animals and plants, and many single-celled organisms, reproduce sexually.

Comparing Sexual and Asexual Reproduction

Asexual	Sexual
Produces genetically identical offspring	Produces genetically diverse offspring
Reproduction is quick and produces large number of offspring	Genetic diversity helps ensure survival of species when environment changes