

BSCS Biology - An Ecological Approach

Chapter 6 - Continuity Through Reproduction

*It's something unpredictable
but in the end it's right.
I hope you had the time of your life.*

From *Time of Your Life* by Green Day

Introduction

Reproduction is an “unselfish” process because it is not necessary for the survival of the individual. Parents live on whether they produce offspring or not. However, if the species as a population is to survive, organisms must reproduce themselves. In many minds reproduction is more than simple survival; it is a biological marvel as well.

Sexual and Asexual Reproduction

The process of **sexual reproduction** involves two different **parent** organisms. Each parent contributes **genetic material** to the new organism as in human reproduction. **Asexual reproduction**, on the other hand, involves only one parent such as a potato “eye” growing into a new plant.

Reproductive Cells

Only **gametes**, also known as **sex cells**, can combine to form a new individual. The male gametes (**sperm**) and female gametes (**ova**) are often much different in size and shape. The names male and female are given to an organism depending upon the type of gametes they produce. Gametes contain one half the amount of genetic material of other body cells and are produced by **meiosis**.

Gamete Development

The development of male and female gametes is very different. **Sperm** is produced in the **testes**. In humans, sperm production begins at puberty and continues through the life of the individual. In human females, ova production begins before birth but complete development is delayed until the human female becomes sexually mature at puberty. **Menstruation** is the beginning of a human female’s fertile life. This process continues until **menopause**.

Hormones

Body “chemical messengers” that are produced and have an impact in other areas of the body are known as hormones. Hormones act to influence other organs to produce other chemicals or perform specific functions. Sex hormones are responsible for many functions having to do with reproduction as well as the sexual drive.

Human Females and Hormones

Hormone interactions in human females are complex. Hormones regulate the female **menstrual cycle**. The **hypothalamus** acts as a regulator in the female system much like a thermostat in a house. In addition, other hormones serve to regulate female egg production and development of the fetus if the female becomes pregnant. **Estrogen** and **progesterone** are additional female hormones that are secreted by the female ovaries. Finally the **pituitary gland** secretes hormones that affect the female ovaries. All of these organs, glands, and hormones are connected through a complex series of chemical reactions. Female hormone reactions change with age, and eventually human females can no longer produce eggs and are no longer fertile. This is known as **menopause** at which time a female’s **monthly cycle** slows and stops.

Fertilization

Only one sperm can fertilize the female egg. Sperm is mixed with semen in the combined mixture that enters the female. Often many sperm cells surround the cell, contributing to the breakdown process that finally allows one sperm to combine with the egg.