Asexual Versus Sexual Reproduction

Somatic Cells

- “body cells”
- DNA in body cells is not passed to offspring
- Body cells contain pairs of chromosomes
- Human body cells have 23 pairs, or 46 individual chromosomes
- The Cell Cycle from Chapter 5 applies to Body Cells

Gametes

- Gametes are sex cells
- In the female, gametes are ova (eggs)
- In the male, gametes are sperm cells
- Gametes do not have pairs of chromosomes
- The human gamete has 23 individual chromosomes
- The DNA in gametes is passed to offspring

Asexual Reproduction

- The creation of an offspring from a single parent
- Does not involve the fusion of gametes
- Offspring are usually genetically identical to each other and to the single parent

Asexual Reproduction

- See Asexual Reproduction video on Blendspace

Sexual Reproduction

- Involves the joining of gametes (eggs and sperm cells) – one from each of two parents
- Offspring produced are a genetic mixture of both parents
- Internal fertilization of eggs by sperm increases chance of gametes meeting – fewer gametes may be produced
- If eggs and sperm are released outside the body, gametes may not meet. Organisms must produce many gametes.

Sexual Reproduction

- See Sexual Reproduction Video on Blendspace

Sexual versus Asexual

- RELATIVE COMPLEXITY OF ORGANISMS
  - Sexual
    - Complex, larger organisms tend to reproduce sexually
  - Asexual
    - Simple, smaller organisms tend to reproduce asexually

Sexual versus Asexual

- NUMBER OF PARENTS CONTRIBUTING GENETIC INFORMATION TO OFFSPRING
  - Sexual
    - Two parents contribute genetic information
    - Offspring have a combination of genetic information from their parents
    - Offspring are unique from their parents and other offspring
  - Asexual
    - One parent contributes genetic information
    - Offspring are exact copies (clones) of the parents

Sexual versus Asexual

- REPRODUCTIVE MECHANISM
  - Sexual
    - Involves the fusion of gametes from two parents
  - Asexual
    - Does not involve gametes
    - Reproduction is by splitting in half, or forming new individuals that are released fro the “parent”

Sexual versus Asexual

- RELATIVE AMOUNT OF PARENTAL CARE
  - Sexual
    - Organisms tend to have longer gestation periods and developing offspring are protected
    - Organisms tend to care for their young, increasing chance of survival
    - Organisms that invest time and energy in caring for their young tend to have fewer offspring
    - Some sexually reproducing organisms do not gestate or care for their young – in these cases, large numbers of gametes or offspring are produced, which helps to offset the death rate of offspring

Sexual versus Asexual

- RELATIVE AMOUNT OF PARENTAL CARE, cont.
  - Asexual
    - Organisms tend to have little or no parental are
    - Organisms that do not care for their young tend to produce large numbers of offspring
    - Organisms may have large numbers of offspring when few offspring survive
    - Organisms that split to produce an “adult” offspring often reproduce rapidly

Sexual versus Asexual

- GENETIC VARIATION OF OFFSPRING
  - Sexual
    - Genetic variation results from sexual reproduction – genetic information from two parents combine
    - Genetic variation helps a species (as a whole) survive. Organisms with slightly different traits due to genetic variation may have survival advantage.
  - Asexual
    - There is no genetic variation in offspring.

Autosomes vs. Sex Chromosomes

- In a human body cell, there are 23 pairs of chrosomes
- 22 of these pairs are **AUTOSOMES**
  - **Autosomes** are chromosomes that contain genes that aren't directly related to the sex of an organism
  - The 23rd pair are chromosomes known as **SEX CHROMOSOMES.** These genes directly control the development of sexual characteristics.

Sex Chromosomes

- There are two different sex chromosomes
- X
- Y

- An organism with two X chromosomes (XX) is **FEMALE**

- An organism with one X and one Y chromosomes (XY) is **MALE**

Haploid vs. Diploid

Haploid Cells, such as gametes, have only one set of chromosomes

- In the human, this means there are 23 individual chromosomes.
- 22 are autosomes, 1 is a sex chromosome

Diploid Cells, such as somatic cells (body cells) have two sets (pairs).