

February 18, 2015

Meiosis and Genetics

Announcements

- Quiz 4 now open
  - Due Sunday 11:59 p,
- Exam 2: Monday February 23<sup>rd</sup>
  - Study Guide now posted on Webcourses
  - Remember to bring scantron

Outline

- Sexual Reproduction
- Meiosis: Process of Making Gametes
- Meiosis and Genetic Diversity
- Introduction to Genetics

Sexual Reproduction

- Offspring has combination of genes from mother and father
  - Increased diversity
- Gametes fuse to create zygote
  - **Gametes:** egg and sperm cells (Haploid)
    - **The cells involved in sexual reproduction**
    - Only have one set of chromosomes from parent
  - **Fertilization:** Fusion of egg and sperm cell
  - **Zygote:** Fertilized egg (Diploid)
    - Offspring has unique genetic characteristics

- Initial stage of life for egg that has been fertilized by sperm
- Haploid gametes conserve original number of chromosomes in offspring
  - o If two diploid ( $2n$ ) cells fused, resulting offspring would be  $4n$ 
    - Four copies of the individual chromosomes
  - o If two haploid ( $n$ ) cells fused, resulting offspring would be  $2n$ 
    - Meiosis is important for conserving this number
- Advantages
  - o High genetic variability among offspring
    - Increase/Maintenance of genetic diversity in population
  - o High variability: greater chance for adaption for changing environments
    - Evolution by natural selection
    - Higher potential for evolution
- Disadvantages
  - o Must find mate
    - For organisms that are not Hermaphrodite
    - Why sex ratios are important in populations
  - o High energy requirements for courtship, gamete production
    - Have to search for a mate
    - Have to do particular dance or ritual

Corals use both methods

- Asexual Reproduction: Budding
- Sexual Reproduction
  - o Meiosis

- Broadcast spawn: spew gametes in water

- o Fertilization
- o Zygote
- o Larva
- o Polyp

#### Clicker Question

- Would you go scuba diving at night?
  - a) Yes
  - b) No

#### Fertilization

- External Fertilization
  - o Aquatic and marine organisms
  - o Gametes released into water
  - o Fertilization occurs when gametes of same species meet in water
  - o Not good for reproducing on land
- Internal Fertilization
  - o Terrestrial animals
  - o Sperm introduced into or near female reproductive tract
  - o Copulation: sexual intercourse
  - o Complex reproductive systems

#### Internal Fertilization

- Sexual selection often important
- Often involves complicated mating rituals for male to attract female