**Meiosis and Sexual Reproduction**

**Asexual Reproduction**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_ -process of producing offspring (babies).

An individual formed by \_\_\_\_\_\_\_\_\_\_\_\_\_\_ is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to its parent.

Asexual reproduction\_\_\_ parent passes all of its traits to its offspring.

Examples: Prokaryotes & Star fish

**Sexual Reproduction**

Sexual reproduction \_\_\_\_\_ parents give genetic material to produce offspring that are genetically \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ from the parents.

Each parent produces a reproductive cell called a \_\_\_\_\_\_\_\_\_\_\_\_\_.

The gamete of one parent fuses with the gamete of another to form a \_\_\_\_\_\_\_\_\_\_, this process is called \_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**Meiosis and gamete formation**

Male animals produce gametes – \_\_\_\_\_\_\_\_\_\_

Male gametes go through meiosis to produce \_\_\_\_\_\_\_ sperm.

Female animals produce gametes – \_\_\_\_\_\_\_\_\_\_

Female gametes go through meiosis to produce \_\_\_\_\_\_\_eggs however one will be larger than the other three which will not make it to maturity (only one egg per cycle)

\_\_\_\_\_\_\_\_\_\_\_\_\_ cells (sperm/egg) are specialized for sexual reproduction.

Only \_\_\_\_\_\_\_\_\_\_ cells can produce \_\_\_\_\_\_\_\_\_\_.

All other body cells are called \_\_\_\_\_\_\_\_\_\_ cells.

\_\_\_\_\_\_\_\_\_\_\_ cells have no participation in reproduction.

Germ cells (\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_) make gametes (\_\_\_\_\_\_\_\_\_cells aka egg and sperm)

Gamete (\_\_\_\_\_\_\_\_\_) + gamete (\_\_\_\_\_\_\_\_) = zygote

**Fertilization**

**Advantages and Disadvantages of sexual and asexual reproduction**

|  |  |
| --- | --- |
| **Sexual** | **Asexual** |
| Mate for companion | Simple and \_\_\_\_\_\_\_ |
| Produces a variety of \_\_\_\_\_\_\_\_\_\_ | Little \_\_\_\_\_\_\_\_ is required this way |
| Offspring are more likely to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  a change because they are all slightly different | Fast and you only need \_\_\_\_\_ parent to do this |
| \_\_\_\_\_\_\_\_\_\_ offspring | \_\_\_\_\_\_\_\_\_\_\_\_ offspring |
| Takes longer and requires more \_\_\_\_\_\_\_\_ | All offspring are \_\_\_\_\_\_\_\_ so they are \_\_\_\_\_\_\_\_\_\_\_\_ to survive a major disaster |

**Chromosome Number**

Each chromosome has thousands of \_\_\_\_\_\_\_\_\_\_\_\_\_ that play an important role in determining how an organism develops and functions.

Draw a picture here

Each organism must have a specific number of chromosomes or that organism will not develop properly.

Haploid vs. Diploid

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ – 1 set of chromosomes (gametes cells only)

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ – 2 sets of chromosomes (all other cells)

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ – 2 of the same chromosomes they will pair together (sister chromatids)

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ – chromosomes that do not code for sex (22 pair)

\_\_\_\_\_\_\_ chromosomes – XY chromosomes that code for the sex/gender of an organism (1 pair)

**Meiosis**

Meiosis is a form of cell \_\_\_\_\_\_\_\_\_ that produces daughter cells with \_\_\_\_\_\_\_\_ the number of chromosomes that are in the parent cell.

During meiosis a diploid cell goes through two divisions to form four haploid cells.

**Comparing Meiosis and Mitosis**

Mitosis makes new cells that are used during growth, development, and asexual reproduction.

Meiosis makes cells that enable an organism to reproduce sexually and happens only in reproductive structures.

**Genetic Variation -** is made possible by \_\_\_\_\_\_\_\_\_\_ reproduction.

In sexual reproduction existing genes are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Meiosis is the process that makes the rearranging of genes possible. Fusion of haploid cells from two different individuals adds further variation.

Three key contributions to genetic variation are:








**Crossing Over**

During \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ I, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ chromosomes line up next to each other.

Each homologous chromosome is made of two sister chromatids attached at the centromere.

Crossing over happens when one arm of a chromatid crosses over the arm of the other chromatid.

Thus the sister chromatids of a homologous chromosome no longer have identical genetic information.

They now have completely different information!

Draw a picture of this!

**Independent Assortment**

Metaphase I, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ chromosomes line up. The two pairs of chromosomes can line up in \_\_\_\_\_\_\_\_\_\_\_\_\_\_ equally probable ways. This \_\_\_\_\_\_\_\_\_\_\_\_ distribution of homologous chromosomes during meiosis is called independent assortment

**Random Fertilization**

Fertilization is a random process that adds\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

The zygote that forms is made by the random joining of two gametes.

**Multicellular life cycles**

All of the events in the growth and development of an organism until the organism reaches sexual maturity are called a life cycle.

**Diploid Facts**

Most animals have a diploid life cycle

Most of the life cycle is spent in the diploid state.

All of the cells except the gametes are diploid

A diploid germ cell in a reproductive organ goes through meiosis and forms haploid gametes.

Haploid gametes fuse to form a diploid zygote.

In diploid life cycles, meiosis in germ cells of a multicellular organism results in the formation of haploid gametes.

**Haploid Life cycle**

Mostly in fungi and protists

The zygote (the only diploid portion of the life cycle) goes through meiosis immediately after it is formed and makes new haploid cells.

In haploid life cycles, meiosis in a diploid zygote results in the formation of the first cell of a multicellular haploid individual.

**Alternation of generation**

Plants and most multicellular protists have a life cycle that alternates between a haploid phase and a diploid phase called alternation of generation.

The plant will produce haploid cells through meiosis that will reach maturity to fuse and form the diploid phase which will then produce haploid cells that will reach maturity and the cycle will repeat itself.