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Science Notes
Chapter 3 – Reproduction

Lesson 3 – What is sexual reproduction?

I. Reproduction by Two Parents

- a. Sexual Reproduction is reproduction by two parents.
- b. An organism gets half its DNA from one parent and half from the other.
- c. Living things that reproduce sexually have special cells called sex cells.
- d. The sex cells of a female parent are called egg cells.
- e. The sex cells of a male parent are called sperm cells.
- f. Sex cells have only half as many chromosomes as other cells in the organism's body.
- g. Sex cells form in a process called meiosis.
- h. In meiosis, one cell divides into four new cells.
- i. Each new cell has only half the number of chromosomes as the parent cell.

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- j. During sexual reproduction, the male cell and the female cell join in a process called fertilization.
- k. During fertilization, an egg cell and a sperm cell unite to form a new cell. This new cell is called a zygote, and is the first cell of a new organism.
- l. Since each sex cell has only half the usual number of chromosomes, the new organism receives a complete set.
- m. The zygote will then divide by mitosis to form the many cells that make up the adult body of the organism.

II. Meiosis

- a. The parent cell makes copies of its chromosomes.
- b. The pairs of chromosomes move apart.
- c. A membrane forms around each group.
- d. The cell divides in two. Each cell has a full set of chromosomes.
- e. Twin chromosomes line up in the middle, split, and single chromosomes move to opposite sides of the cell.

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- f. A membrane forms around each set of chromosomes.
- g. Cells divide in two. These are now sex cells. They have only half as many chromosomes as the original parent cell.

III. Fertilization in Flowering Plants

- a. A flower is an adaptation that allows a plant to reproduce sexually.
- b. In flowering plants, fertilization takes place in the flower.
- c. The male sex cells of flowering plants are in pollen.
- d. The female egg is produced at the bottom of the pistil.
- e. For a flowering plant to reproduce, pollen must get from a stamen to a pistil.
- f. Fertilization of flowering plants can occur many ways:
 - i. Some plants depend on insects to transfer pollen from a stamen to pistil.
 - ii. Birds, mammals, and insects can carry pollen too.
 - iii. Plants can also depend on wind, water, or other sources to carry pollen.

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IV. Fertilization in Animals

- a. Animals too must join a sperm cell and egg cell to reproduce.
- b. Fertilization can take place inside or outside the body of the female.
- c. Fertilization that takes place outside the body is called external fertilization.
- d. Each time a sperm and egg unite, a zygote forms and a new individual begins to develop.
- e. Animals like the staghorn coral usually produce large numbers of sperm and eggs. But only a few of the fertilized eggs will survive to become adults.
- f. For most species of animals that live on land, fertilization takes place inside the female's body.
- g. Fertilized eggs also need moisture. In some animals, the zygote develops in the female's body. Other animals have eggs with shells that protect the animals developing within.

V. Individuals Differ

- a. Offspring produced by sexual reproduction share characteristics of both parents.

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- b. Each individual has a unique set of DNA. Meiosis is the reason.
- c. Each combination is unique because it formed from a different sperm and egg cell.
- d. This means each organism inherits a different combination of DNA which gives each organism different characteristics.

VI. Comparing Sexual and Asexual Reproduction

- a. Each type of reproduction has its advantages and disadvantages.
- b. Asexual Reproduction:
 - i. Happens quickly
 - ii. Requires less energy
 - iii. Needs just one parent cell
 - iv. Produces offspring with DNA identical to parent
- c. Sexual Reproduction
 - i. Is a slow process
 - ii. Requires more energy
 - iii. Must have two parents cells
 - iv. Produces offspring with unique DNA which allows them to adapt to the environment.