

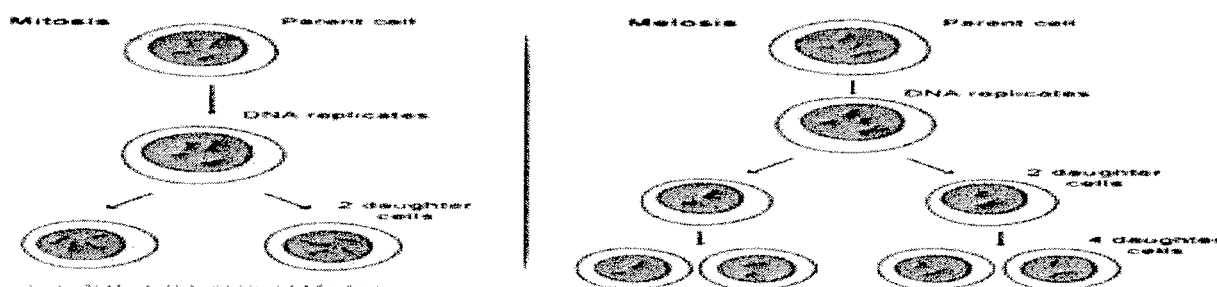
Key Idea 4/Standard 4 Living Environment Reproduction and Development

Sexual reproduction is not necessary for the individual but is needed for the continuation of the species

In asexual reproduction all the genetic information comes from one parent. The production of identical genetic copies is called cloning.

Sexual reproduction involves two parents. The offspring have a mixture of genetic material with half coming from each parent. This process is called recombination and provides for variation better suiting sexually reproduced offspring for survival.

Comparison of Mitosis and Meiosis		
Characteristic	Mitosis	Meiosis
Number of cell divisions	1	2
Number of cells formed	2	4
Genetic variation	no	Yes (b/c of crossing over)
Types of cells formed	all cells but gametes	Gametes only
Chromosome number of cells formed compared to the parent	same #	Half the #



The egg or sperm contain 1/2 of the genetic information of the offspring. The zygote is formed by the union of egg and sperm and has the 2n chromosome number.

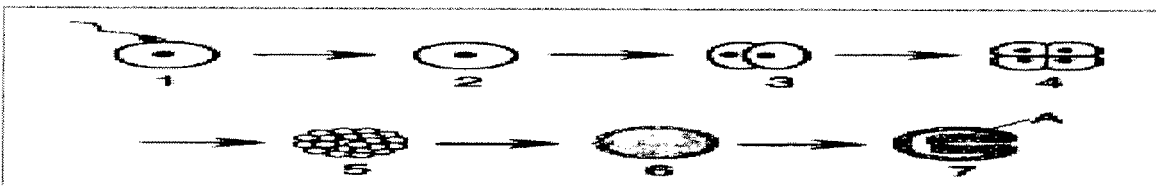
The processes of meiosis and fertilization restore the chromosome number in the offspring formed by sexual reproduction.



n (egg) + n (sperm) \rightarrow $2n$ (zygote)

Development of the single celled zygote into a multicellular organism occurs by a cell division process called mitosis.

Differentiation -- means to develop the specialized cells, tissues and organs of a living thing which have specific functions.



Use the diagram above to answer the following questions.

- 1.) What process is occurring at number one? fertilization
- 2.) What is cell two called and what is its chromosome number? zygote (2n)
- 3.) The cell divisions following stage # 2 represent what process? mitosis
- 4.) The stage at number 7 (called a gastrula) is developing cells and tissues with specific functions. What is this process called?
differentiation
- 5.) The cells of the embryo develop into different organs with different function because different genes in these cells are turned on and off even though all non-sex cells in the fetus have identical DNA.

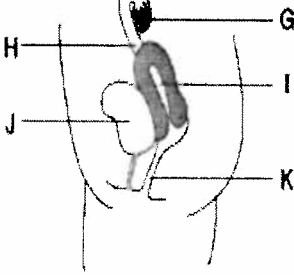
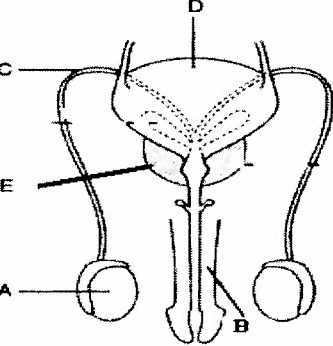
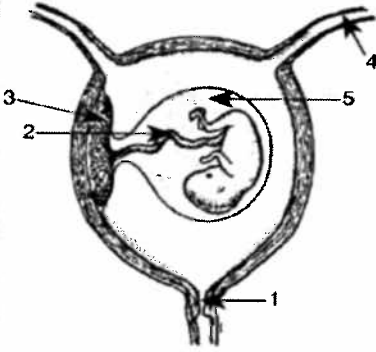
Testosterone -- stimulates the development of male secondary sex characteristics

Estrogen -- stimulates the development of female secondary sex characteristics and initiates the thickening of the uterine lining

Progesterone -- is produced by the corpus luteum in the empty follicle of the ovary and maintains the thickness of the uterus lining in case a pregnancy occurs

What is the function of the mammary glands? _____

Label each structure in the diagrams below and state their function.

 <p>A diagram of the female reproductive system. Label G points to the ovary, H to the fallopian tube, I to the uterus, J to the urinary bladder, and K to the vagina.</p>	<p>g.) ovary -- forms egg h.) fallopian tube -- where fertilization occurs i.) uterus -- where fetus develops j.) urinary bladder -- stores urine k.) vagina -- where sperm is deposited or baby comes out</p>
 <p>A diagram of the male reproductive system. Label A points to the testis, B to the penis, C to the vas deferens, D to the urinary bladder, and E to the prostate gland.</p>	<p>a. testis -- makes sperm b. penis -- adaptation for internal fertilization c. vas deferens -- carries sperm from tests d. urinary bladder -- stores urine e. prostate gland -- a lubricating gland which helps form semen</p>
 <p>A diagram of a fetus in the uterus. Label 1 points to the cervix, 2 to the umbilical cord, 3 to the placenta, 4 to the fallopian tube, and 5 to the amnion.</p>	<p>1 = cervix - entry to and from uterus 2 = umbilical cord -- carries wasters from fetus to placenta and useful materials like food and O2 from placenta to fetus 3 = placenta --- allows diffusion of materials from Mother to fetus and vice versa 4 = fallopian tube -- where fertilization occurs 5 = amnion -- protects fetus against injury</p>

List four environmental factors which adversely influence development and explain how they adversely influence this development.

___ smoking -- robs baby of oxygen so is born under weight _____

___ lead --- reduces babies IQ _____

___ alcohol -- fetal alcohol syndrome _____

___ some drugs -- cause addiction of fetus _____

Why is the fetus most vulnerable to the effects of drugs during the first three months of pregnancy?

_____ Most organ development occurs in the first three months _____

Provide a specific example of an infection in the Mother threatening the development of the fetus.

_____ rubella-- may lead to deafness in fetus _____

Explain how improper nutrition in the Mother could affect the fetus.

___ May lead to baby getting insufficient nutrients and being born under weight. _____

Reproductive Technologies

What is an amnioscentesis and why might this be performed?

___ Taking a sample of amniotic fluid containing fetal cells to see if the chromosomes have a genetic defect. _____

What is in vitro fertilization and why might this be done?

_____ Fertilization outside the body done if Mother can not conceive ... early embryo implanted in Mother's uterus. _____