Molecular Basis of Heredity - Ideas the textbook reviewers looked for:

Heritable characteristics ultimately produced in the development of an organism can be observed at molecular and whole-organism levels - in structure, chemistry, or behavior.

When mutations occur in sex cells, they can be passed on to all cells in the resulting offspring; if mutations occur in other cells, they can be passed on to descendant cells only.

The sorting and recombination of genes in sexual reproduction results in a great variety of possible gene combinations in the offspring of any two parents.

An altered gene may be passed on to every cell that develops from it.

A mutation of a DNA segment may not make much difference in the operation of the cell, may fatally disrupt the operation of the cell, or may change the successful operation of the cell in a significant way.

Some faulty operations of body processes are known to be caused by altered genes. They may have direct, obvious effects, such as causing bleeding, or they may only increase the body's susceptibility to developing particular diseases, such as clogged arteries or mental depression.

Protein molecules are long, often elaborately folded chains made from 20 different kinds of smaller (amino-acid) molecules. The function of each protein molecule depends on its shape. The shape depends on interactions among the amino acids and between them and their environment.

A change in even a single atom in the DNA molecule... can change the protein that is produced.

to and from **Cell Structure and Function**

...for example, it may foster uncontrolled replication, as in cancer.

Insertions, deletions, or substitutions in DNA can alter genes.

Changes in DNA (mutations) occur spontaneously at slow rates.

Cells repeatedly divide to make more cells for growth and repair.

Genes are located in the chromosomes of each cell. Each DNA molecule in a cell forms a single chromosome.

Genes are segments of DNA molecules. Each DNA molecule contains thousands of discrete genes.

The genetic information stored in DNA is used to direct the synthesis of the thousands of proteins that each cell requires.

A model of something is a simplified imitation of it that we hope can help us understand it better... its value lies in suggesting how things either do work or might work.

DNA molecules are long chains linking just four kinds of smaller molecules, whose precise sequence encodes genetic information.

Mapping of genetic instructions in cells makes it possible to detect defective genes that may lead to poor health.

The genetic information passed from parents to offspring is coded in DNA molecules.

to and from **Cell Structure and Function**

The genetic code found in DNA is the same for almost all species of organisms, from bacteria to humans.

As the fertilized egg, carrying genetic information from each parent, multiplies to form the complete organism with about a trillion cells, the same genetic information is copied in each cell.

All matter is made up of atoms.... Atoms may stick together in molecules, or may be packed together in large arrays. Different arrangements of atoms in groups compose all substances.

The work of cells is carried out by the many different types of molecules it assembles, mostly proteins.

Molecular Basis of Heredity - What the textbooks typically do:

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