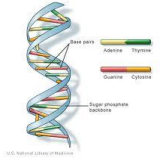




Heredity and Adaptations of Organisms Unit Planner/Study Guide



Name: _____ Packet Score: _____/72

Step 1: What are we teaching and learning?

Content Standard: Students will understand that offspring inherit traits that make them more or less suitable to survive in the environment.

Unit Story: Living things are made of smaller structures whose functions enable the organisms to survive. The basic unit of structure in all living things is the cell. Cells combine to form tissues that combine to form organs that combine to form systems that work together for the benefit of the entire organism. While most cells have common structures, there are differences between plant and animal cells. Cell details are usually visible only through a microscope.

Reproduction passes genetic information (**DNA**) from parent to offspring. **Asexual reproduction** requires one parent and produces nearly identical offspring. **Sexual reproduction** requires two parents, and provides variety in a species. This variety may allow the species to **adapt** to changes in the environment and help the species survive. A species may change due to the passing of inherited traits naturally or by techniques used and developed by science. Genetic information is passed on in a predictable manner. Not all traits are **inherited**, some are **acquired** (you learn or gain them instead of being born with them).

BOLDED Text = Tested on CFA's Normal Text = Not tested on CFA's

Objective 1: Compare how sexual and asexual reproduction passes genetic information from parent to offspring.

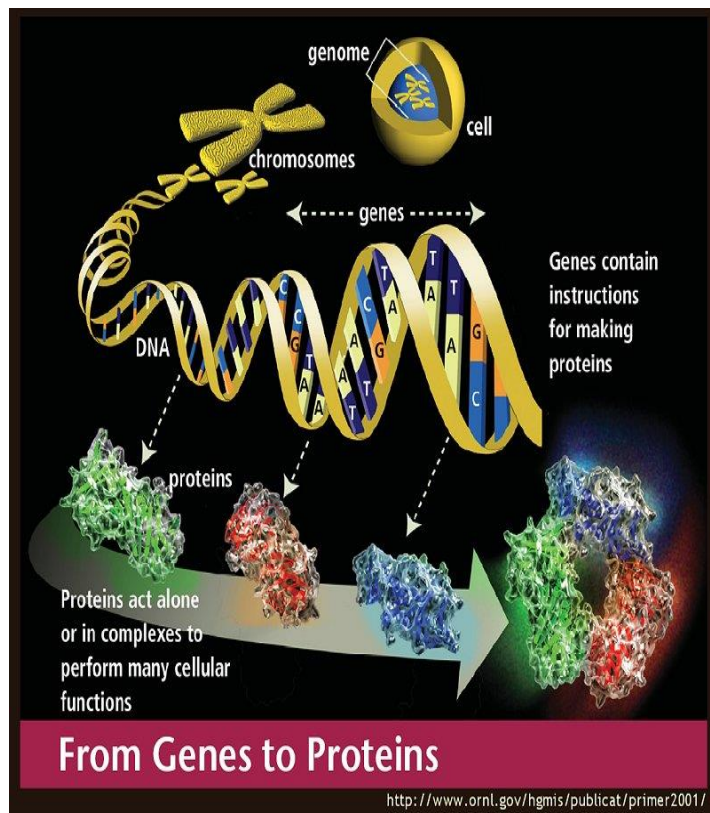
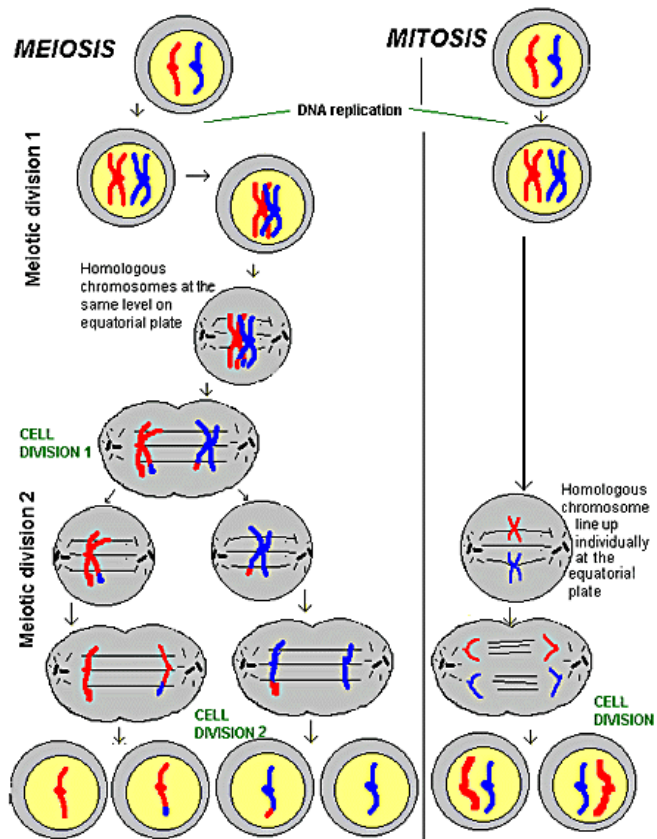
- a. **Distinguish between inherited and acquired traits.**
- b. **Contrast the exchange of genetic information in sexual and asexual reproduction (e.g., number of parents, variation of genetic material).**
- c. **Cite examples of organisms that reproduce sexually (e.g., rats, mosquitoes, salmon, sunflowers) and those that reproduce asexually (e.g., hydra, planaria, bacteria, fungi, cuttings from house plants).**
- d. Compare inherited structural traits of offspring and their parents.

Objective 2: Relate the adaptability of organisms in an environment to their inherited traits and structures.

- a. **Predict why certain traits (e.g., structure of teeth, body structure, and coloration) are more likely to offer an advantage for survival of an organism.**
- b. Cite examples of traits that provide an advantage for survival in one environment but not other environments.
- c. **Cite examples of changes in genetic traits due to natural and manmade influences (e.g., mimicry in insects, plant hybridization to develop a specific trait, breeding of dairy cows to produce more milk).**
- d. **Relate the structure of organs to an organism's ability to survive in a specific environment (e.g., hollow bird bones allow them to fly in air, hollow structure of hair insulates animals from hot or cold, dense root structure allows plants to grow in compact soil, fish fins aid fish in moving in water).**

Step 2: Evidence of Learning

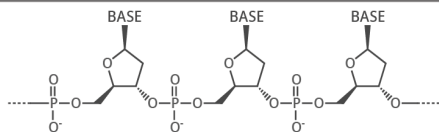
Common Formative Assessments	1 st Time (In Class)	2 nd Time (In PEAK)	3 rd Time (In PEAK)
CFA Quiz 11			
CFA Quiz 12			
Pre-Test %	Post-Test %	Growth %	



THE CHEMICAL STRUCTURE OF DNA

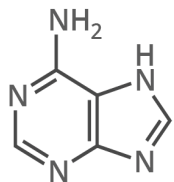
DNA (deoxyribonucleic acid) carries genetic information in all multicellular forms of life. It carries instructions for the creation of proteins, which carry out a wide range of roles in the body.

THE SUGAR PHOSPHATE 'BACKBONE'

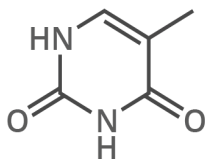


DNA is a polymer made up of units called nucleotides. The nucleotides are made of three different components: a sugar group, a phosphate group, and a base. There are four different bases: adenine, thymine, guanine & cytosine.

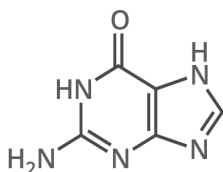
A ADENINE



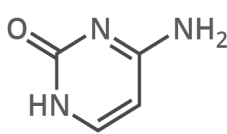
T THYMINE



G GUANINE

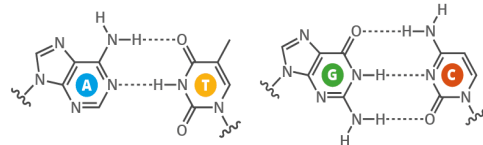


C CYTOSINE



WHAT HOLDS DNA STRANDS TOGETHER?

DNA strands are held together by hydrogen bonds between bases on adjacent strands. Adenine (A) always pairs with thymine (T), whilst guanine (G) always pairs with cytosine (C).



FROM DNA TO PROTEINS



The bases along a single strand of DNA act as a code. The letters form three letter 'words', or codons, which code for different amino acids - the building blocks of proteins.

An enzyme, RNA polymerase, transcribes DNA into mRNA (messenger ribonucleic acid). It does this by splitting apart the two strands that form the double helix, then reading a strand and copying the sequence of nucleotides. The only difference between the RNA and the original DNA is that in the place of thymine (T), another base with a similar structure is used: uracil (U).

DNA SEQUENCE	T	T	C	C	T	G	A	A	C	C	C	G	T	T	A
mRNA SEQUENCE	U	U	C	C	U	G	A	A	C	C	C	G	U	U	A
AMINO ACID	Phenylalanine		Leucine		Asparagine		Proline		Leucine						

In multicellular organisms, the mRNA carries genetic code out of the nucleus, to the cell's cytoplasm. Here, protein synthesis takes place. 'Translation' is the process of converting the mRNA's 'code' into proteins. Molecules called ribosomes carry out this process, building up proteins from the amino acids coded for.

