Theme 2: Matter

Content & Skills Guide

Chapters covered:

2, 3, 4, 5, 6, 7

Standards:

Standard	Standard Description	Chapters/sections
2.1	Organisms must exchange matter with the environment to grow, reproduce and maintain organization. (EK2.A.3)	3.1, 3.2, 3.3, 4.1, 4.2, 6.2
2.2	The subcomponents of biological molecules and their sequence determine the properties of that molecule. (EK4.A.1)	5.1, 5.2, 5.3, 5.4, 5.5
2.3	Variation in molecular units provides cells with a wider range of functions. (EK4.C.1)	5.1, 5.2, 5.3, 5.4, 5.5
2.4	Cell membranes are selectively permeable due to their structure. (EK2.B.1)	7.1, 7.2
2.5	Growth and dynamic homeostasis are maintained by the constant movement of molecules across membranes. (EK2.B.2)	7.3, 7.4, 7.5
2.6	Eukaryotic cells maintain internal membranes that partition the cell into specialized regions. (EK2.B.3)	6.2, 6.3, 6.4, 6.5
2.7	The structure and function of subcellular components, and their interactions, provide essential cellular processes. (EK4.A.2)	6.2, 6.3, 6.4, 6.5

Test Date:

December 15th, 2015

Speaking Biologian (Vocabulary):

amino acid
amphipathic
carbohydrate
carbon
denaturation
disaccharide
ester bond
fibrous protein
globular protein
glycosydic bond
hydrogen bond
ion
lipid
macromolecule
monomer
monosaccharide
nitrogen
non-polar molecule
nucleic acid
nucleotide
organic molecule
peptide bond
phospholipid
polar molecule
polymer
protein
water

active transport
amphipathic
apoptosis
aquaporin
carrier protein
cell wall
centrioles
channel protein
chloroplast
concentration
gradient
cytoplasm
cytoskeleton
diffusion
electron
microscope
endocytosis
endoplasmic
reticulum
glycolipid
glycoprotein
Golgi apparatus
hypertonic
hypotonic
ion pump
isotonic
ligand
light microscope
lysosome
magnification
membrane
mitochondrion
nuclear envelope
nuclear pore
phospholipid
pinocytosis
plasma membrane
plasmolysis
prokaryotic cell
resolution
ribosome
rough ER
selectively
permeable
smooth ER
exocytosis
eukaryotic cell
facilitated diffusion
flagella
fluid mosaic model
nucleus
organelles
osmosis
passive transport
phagocytosis
turgor
surface
area:volume ratio
transmembrane
protein
turgor pressure

Must Knows:

Ch. 2	Ch. 3
• The three subatomic particles and their significance. • The types of chemical bonds and how they form. • The importance of hydrogen bonding to the properties of water.	• Four unique properties of water, and how each contributes to life on Earth. • How to interpret the pH scale. • How change in the pH can alter biological systems. • The importance of buffers in biological systems.
Ch. 4	**Ch. 5**
• The properties of carbon that make it so important.	• The role of dehydration reactions in the formation of organic compounds and hydrolysis in the digestion of organic compounds. • How the sequence and subcomponents of the four groups of organic compounds determine their properties. • The cellular functions of carbohydrates, lipids, proteins, and nucleic acids • How changes in these organic molecules would affect their function. • The four structural levels of proteins and how changes at any level can affect the activity of the protein. • How proteins reach their final shape (conformation), the denaturing impact that heat and pH can have on protein structure, and how these changes may affect the organism. Directionality influences structure and function of polymers, such as nucleic acids (5' and 3' ends) and proteins (amino and carboxyl ends).
Ch. 6	**Ch. 7**
• Three differences between prokaryotic and eukaryotic cells. • The structure and function of organelles common to plant and animal cells. • The structure and function of organelles found only in plant cells or animal cells. • How different cell types show differences in subcellular components. • How internal membranes and organelles contribute to cell functions. • How cell size and shape affect the overall rate of nutrient intake and waste elimination.	• Why membranes are selectively permeable. • The role of phospholipids, proteins, and carbohydrates in membranes. • How water will move if a cell is placed in an isotonic, hypertonic, or hypotonic solution and be able to predict the effect of different environments on the organism. • How electrochemical gradients and proton gradients are formed and function in cells.