Exclusion Statements from AP Biology New Framework

 **Big Idea 1: Evolution**

1. Fossils can be dated by a variety of methods that provide evidence for evolution. These include the age of the rocks where a fossil is found, the rate of decay of isotopes including carbon-14, the relationships within phylogenetic trees, and the mathematical calculations that take into account information from chemical properties and/or geographical data. (p. 109)

✘✘ *The details of these methods are beyond the scope of this course and the AP Exam.*

b. Species extinction rates are rapid at times of ecological stress. [See also **4.C.3**] (p. 113)

*To foster student understanding of this concept, instructors can choose an illustrative example such as:*

• Five major extinctions

• Human impact on ecosystems and species extinction rates

✘✘ *The names and dates of these extinctions are beyond the scope of this course and the AP Exam.*

**Big Idea 2: Cells and Energy**

2.A.2.b

✘✘ *Specific steps, names of enzymes and intermediates of the pathways for these processes are beyond the scope of the course and the AP Exam.* (p. 121)

But students still need to understand that autotrophs capture free energy from physical sources in the environment, while heterotrophs capture free energy present in carbon compounds

produced by other organisms.

2.A.2.d

✘✘ *Memorization of the steps in the Calvin cycle, the structure of the molecules and the names of enzymes (with the exception of ATP synthase) are beyond the scope of the course and the AP Exam.*

(p. 122)

But students still need to know ATP synthase and the big picture of how the photosystems, electron carriers, and ETC work together.

2.A.2.f

✘✘ *Memorization of the steps in glycolysis and the Krebs cycle, or of the structures of the molecules and the names of the enzymes involved, are beyond the scope of the course and the AP Exam.*

(p. 123)

But they still need to know that cellular respiration in eukaryotes involves a series of coordinated enzyme-catalyzed reactions that harvest free energy from simple carbohydrates.

2.A.2.g

✘✘ *The names of the specific electron carriers in the ETC are beyond the scope of the course and the AP Exam.* (p. 124)

But still need to know that the electron transport chain captures free energy from electrons in a

series of coupled reactions that establish an electrochemical gradient across membranes.

2.B.2

✘✘ *There is no particular membrane protein that is required for teaching this concept. (p.128)*

But still need to know passive transport – no energy required. Choose one to explain the idea well – students will have the knowledge

2.C.2

***PYF -****No specific behavioral or physiological mechanism is required for teaching this concept. Teachers are free to choose the mechanism that best fosters student understanding. (p.132)*

But still need to understand that organisms respond to changes in their environment through

Behavioral and physiological mechanisms.

2.D.1

***PYF -****No specific example is required for teaching these concepts. Teachers are free to choose an example that best fosters student understanding. (p. 134)*

But they still need to know that all biological systems from cells and organisms to populations, communities and ecosystems are affected by complex biotic and abiotic interactions involving exchange of matter and free energy.

2.D.3

***PYF*** *No specific system is required for teaching the above concepts. Teachers are free to choose the system that best fosters student understanding. (p. 135)*

But they still need to know that disruptions at the molecular and cellular levels affect the health of the organism and that disruptions to ecosystems impact the dynamic homeostasis or balance of the ecosystem.

2.D.4

✘✘ *Memorization of the structures of specific antibodies is beyond the scope of the course and the AP Exam*.

But still need to thoroughly know the immune system, including the antibodies and how they work.

2.E.1

✘✘ *Names of the specific stages of embryonic development are beyond the scope of the course and the AP Exam.*

But they still need to know that observable cell differentiation results from the expression of genes for tissue-specific proteins, that induction of transcription factors during development results in sequential gene expression, and that programmed cell death (apoptosis) plays a role in the normal development and differentiation.

2.E.2 a

✘✘ *Memorization of the names, molecular structures and specific effects of all plant hormones are beyond the scope of the course and the AP Exam. (p. 139)*

But they still need to know that, in plants, physiological events involve interactions between

environmental stimuli and internal molecular signals.

2.E.2 b and c

✘✘ *Memorization of the names, molecular structures and specific effects of hormones or features of the brain responsible for these physiological phenomena is beyond the scope of the course and*

*the AP Exam. (p. 140)*

But they still need to know that, in animals, fungi, protists, and bacteria, internal and external signals regulate a variety of physiological responses that synchronize with environmental cycles and cues.

**Big Idea 3: Genetics** (p 142)

✘ The names of the steps and particular enzymes involved, beyond DNA polymerase, ligase, RNA polymerase, helicase and topoisomerase, are outside the scope of the course for the purposes of the AP Exam. (p. 146)

pre knowledge

✘ The details and names of the enzymes and factors involved in each of these steps are beyond the scope of the course and the AP® Exam. (p. 148)

in the area of transcription and translation no need to know details or specifics regarding enzymes

✘ Memorization of the genetic code is beyond the scope of the course and the AP Exam. (p. 148)

duhhhhh.................

✘ Knowledge of any one cyclin-CdK pair or growth factor is beyond the scope of the course and the AP Exam. no depth into CDK only their brief description (p. 151)

✘ Memorization of the names of the phases of mitosis is beyond the scope of the course and the AP Exam. pre knowledge (p. 151)

✘✘ Epistasis and pleiotropy are beyond the scope of the course and the AP Exam is out! (p. 154)

✘✘ Details and specifics about the various processes are beyond the scope of the course and the AP Exam. need to know minimal details regarding bacteria reproduction (p.161)

✘✘ The details of sexual reproduction cycles in various plants and animals are beyond the scope of the course and the AP Exam. (p. 161)

However, the similarities of the processes that provide for genetic variation are relevant and should be the focus of instruction.

No alternation of generations, can use these as examples to relate humans and plants for cell signaling and biochemical communication

**PYF** No specific system, with the exception of the endocrine system, is required for teaching the concepts in 3.D.2 . Teachers are free to choose a system that best fosters student understanding.

Study of the nervous and immune systems is required for concepts detailed

in 3.E.2 and 2.D.4. (p.166)

Need to know the 3 required first (immune, endocrine, nervous) by providing examples and processes

**PYF** No particular system is required for teaching the concepts above. Teachers are free to choose a system that best fosters student understanding. (p. 167)

**Need to know the 3 required first (immune, endocrine, nervous) by providing examples and processes**

✘ Specific mechanisms of these diseases and action of drugs are beyond the scope of the course and the AP Exam. (p. 168)

Provide related diseases to immune, endocrine, and nervous system but do not go into extreme details of that disease, KNOW insulin

**PYF** The details of the various communications and community behavioral systems are beyond the scope of the course and the AP Exam give minimal examples of organisms communications (p. 171)

✘✘ The types of nervous systems, development of the human nervous system, details of the various structures and features of the brain parts, and details of specific neurologic processes are beyond the scope of the course and the AP Exam. (p. 173)

Minimal structure of brain, hemispheres and where information is processed

**Exclusions - Big Idea 4 (p. 174)**

✘✘ Specific molecular structures of: (p. 177)

* Nucleotide bases
* Amino acids (don’t memorize R groups, e.g.)
* Lipids, Carbohydrate polymers
* *KEEP: functional groups necessary to classify these macromolecules*

✘✘ Specific organelle functions in specialized cells: (p. 179)

* Smooth ER
* Gogli
* *KEEP: General functions of organelles (for all cells)*

✘✘ Specific lysosome pathways

✘✘ Structure of chlorophyll (p. 180)

* *KEEP: function of chlorophylls*

✘✘ Don’t need to teach specific cofactors/coenzymes (p. 185)

* *KEEP: function and role in enzymatic processes*

**X** Specific examples of symbiotic interactions (p. 187)

* *KEEP: definitions of interactions, recognize interactions*
* *KEEP (to be safe): give examples of each interaction (but choose whatever example you want)*