

Exam 2 Topics Overview
(this is a growing list, check back from time to time)

Topic 06 – Flow of Energy in the Biosphere

I. Respiration

- A. Glycolysis
- B. Preparation for the Krebs (Citric Acid) Cycle
- C. Citric Acid Cycle
- D. Electron Transport Chain and Chemiosmosis

II. Photosynthesis

- A. Generalities of photosynthesis
- B. Chloroplast structure
- C. Details of photosynthesis
 - 1. Light reactions (Electron Transport Chain and Chemiosmosis)
 - 2. Light-independent reactions (the Calvin Cycle)

Topic 07 – Asexual Cell Division

I. Introduction

II. Binary Fission in Prokaryotes

III. Mitotic Cell Division in Eukaryotes

- A. Cell Cycle
- B. Mitosis
- C. Cytokinesis

Topic 08 – Genes and DNA

I. Genes

- A. Chromosomes
- B. Genes

II. DNA

- A. Defined
- B. Polymerization

III. DNA Replication

- A. Semi-Conservative Model Basics
- B. Key enzymes
- C. Semi-Conservative Model Details

Topic 09 – Ethnobotany of Halloween

I. Jack of the Lantern

- A. Jack and an encounter with the Devil.
- B. 10 years Later
- C. Jack becomes Jack of the Lantern
- D. Irish and Scottish Halloween Tradition

II. *Cucurbita pepo*

- A. The genus *Cucurbita*.
- B. Origins of *Cucurbita pepo*.
- C. Morphology of *Cucurbita pepo*.
- D. The fruit and flower of *Cucurbita pepo*.
- E. Diversity of *Cucurbita pepo* cultivated varieties.

Topic 10 – From Genotype to Phenotype: Transcription & Translation

I. Transcription

- A. DNA as the template for RNA Synthesis
- B. Differences between RNA and DNA
- C. Editing of RNA transcript prior to leaving nucleus

II. Types of RNA

- A. mRNA
- B. rRNA
- C. tRNA

III. Translation (of mRNA transcript for protein coding genes)

- A. Characteristics of the Genetic Code.
- B. The ribosome (and the role of rRNA).
- C. Role of tRNA.

Topic 11 – Genetics

I. Introduction

- Roots of genetics.
- Gregor Mendel and his experiments.
- Punnett Squares.

II. Mendel's Monohybrid Crosses

- A. Characteristics
- B. Sample cross
- C. Conclusions

III. Mendel's Dihybrid Crosses

- A. Characteristics
- B. Sample cross
- C. Conclusions