Focus Topics Unit 4: Cell Communication:

Cell Communication Methods
3 Phases of Signal Transduction
G Protein Transduction Pathway
Cascade Transduction Pathway
Apoptosis
Positive and Negative Feedback Mechanisms
Cell division in prokaryotes vs eukaryotes
Interphase phases
Chromosome structure and function
Mitosis Phases (Chromosome numbers)
Control of Cell Cycle Checkpoints
Cancer

Cell Communication Methods:

Students should be able to describe the basic communication methods of cells including juxtacrine, autocrine, paracrine, endocrine, and synaptic signaling. Students should be able to provide examples of each type and its role in cell communication.

3 Phases of Signal Transduction:

Students should be able to describe the 3 phases of signal transduction. Students should be able to describe the relationship between ligands and receptors. Students can identify common ligands and the locations/types of intracellular receptors.

G Protein Transduction Pathways:

Students should be able to describe the 3 phases in regards to the G Protein pathway. Be able to describe each phase and how it relates to the pathway.

Cascade Pathways:

Students should be able to describe the 3 phases in regards to the G Protein pathway. Be able to describe each phase and how it relates to the pathway. See Signal Transduction Pathway Pogil Model 2:

Apoptosis:

Students should be able to describe the process of Apoptosis and why it is an essential process of development.

Positive and Negative Feedback Mechanisms:

Students should be able to describe positive and negative feedback loops. Students should be able to provide examples of each type.

Cell Division in Prokaryotes vs Eukaryotes:

Students should be able to describe how prokaryotes divide to produce new cells. Students should be able to describe how eukaryotes divide to produce new cells. Students should be able to describe the nature of chromosomes each cell type has.

Interphase Phases:
Students should be able to identify and describe the phases in interphase.

Chromosome structure and function:
Students should be able to describe the structure and function of chromosomes. Students should be able to differentiate between chromosomes, chromatid, sister chromatids, centromeres, histones, and homologous chromosomes.

Phases of mitosis (# of Chromosomes in each phase)
Students should be able to describe the major events which occur in each phase of mitosis.

Control of Cell Cycle (checkpoints)
Students should be able to describe the control points in the cell cycle. Students should be able to describe what factors will stop the progress of cell division and the factors which are required to allow cell division to progress.

Cancer
Students should be able to describe what cancer is and what factors are able to create cancers.