**Carbohydrates**

**11.1: Monosaccharides**

* Recognize monosaccharides and their derivatives.
  + Distinguish aldoses and ketoses.
  + Recognize enantiomers, epimers, and anomers.
  + Identify the parent sugar in carbohydrate derivatives.

Carbohydrate nomenclature/classification

Carbohydrate chirality

Epimers

Anomers

Derivatives

**11.2: Polysaccharides**

* Relate the structures of polysaccharides to their biological functions.
  + Explain why monosaccharides can be linked in multiple ways.
  + Recognize lactose and sucrose.
  + Describe the structures and functions of starch, glycogen, cellulose, chitin and biofilms.

Lactose

Sucrose

Starch

Glycogen

Cellulose

Chitin

Biofilms

**11.3: Glycoproteins**

* Describe the structures and functions of glycoproteins.
  + Distinguish *N*- and *O*-linked oligosaccharides.
  + Summarize the functions of oligosaccharide markers.
  + Explain how proteoglycans function in shock absorption and microbial defense.
  + Describe peptidoglycan as a strong, elastic, and porous casing for bacterial cells.

*N*-linked processing

*O*-linked processing

Biological markers

Proteoglycans

Peptidoglycans