Learning Objectives
Chapter 18 – Carbohydrates

- What are the three major elements in carbohydrates?
- What is another name for carbohydrates?
- What are the major functional groups in saccharides? You should be able to look at a carbohydrate structure and determine if it’s a carbohydrate and what kind of carbohydrate it is.
- What is the difference between monosaccharides, disaccharides, and polysaccharides? Between trioses, tetroses, pentoses, and hexoses? Between aldoses and ketoses? You should be able to look at a structure and determine, for example, if you have an aldose or a ketose.
- What are the two different forms of monosaccharides? Which one is biologically active?
- What does it mean if mirror images are superimposable? You should be able to draw (or make a model of) a molecule and then determine if the two mirror images are superimposable or not.
- What is a chiral carbon? You should be able to look at a structure and identify chiral carbons.
- What is the difference between structural isomers and stereoisomers?
- What are the two types of stereoisomers?
- You should be able to look at structures of two different carbohydrates and determine if they are structural isomers, enantiomers, or diastereomers.
- What do the lines indicate in Fischer projections? You should be able to look at a carbohydrate structure and determine if it corresponds a D- or L- sugar.
- What are Haworth structures? You should be able to use a Fischer Projection to draw a Haworth projection.
- What is the difference between alpha and beta anomers? What is mutarotation?
- What is the product of oxidation of monosaccharides? You should be able to predict the product of the oxidation of a particular carbohydrate.
- What is the product of the reduction of monosaccharides? You should be able to predict the product of the reduction of a particular carbohydrate.
- What product is formed between an alcohol and a monosaccharide?
- What product is formed between phosphoric acid and a monosaccharide?
- What product is formed between an amine and a monosaccharide?
- What monosaccharides make up lactose? Maltose? Sucrose? Cellobiose?
- What is the name of the bond between two monosaccharides? You should be able to look at a disaccharide and determine if this bond is in the alpha form or the beta form.
- You should know the difference between amylase, amylopectin, glycogen and cellulose (in the amount of branching and in the types of bonds present).