

Biology Lab

Teacher: Mrs. Edie Dukek

This biology laboratory supplements *a complete biology course you will be taking at home*. We could perform the explorations in almost any order. However, we will be doing the labs in the order of subjects in Apologia's *Exploring Creation with Biology* by Jay Wile. Some of the labs we do may be the same as those in Apologia, but many will not. The descriptions are subject to revision. **The dates listed are the dates we will have class**, unless Marion Independent declares that school will not be held, such as a snow day. If at any time you wish more explanation about a topic or you have a question about the class, feel free to call me, 270-0693; or email me, edukek@marion-isd.org I also encourage you to perform experiments at home from your text. The more biology you do, the more you will learn!

September 8: Module 1, Biology, the Study of Life

We will discuss the system of biological classification (KPCOFGS). Then we will create our own dichotomous key to identify class members' shoes.

September 15: Iowa's Roadside Prairies

The class will identify prairie wildflowers and discuss what the Iowa Department of Transportation has been accomplishing to reintroduce our native biome, the tall grass prairie, back into roadside ditches.

September 22: Module 2, The Microscope

Students will learn the parts of a microscope and how to use it properly. They will make their own wet mounts and examine prepared slides.

September 29: Stream Studies

The class will meet at Indian Creek in Thomas Park (turn left as you come into the park) and will use provided hip waders and nets to collect and identify macroinvertebrates (larval insects) we find in the stream. If a hard rain is in progress, we will meet at the building. If in doubt, call the office at 373-9209. Three to five days *before next week's class*, students may prepare their own pond or stream specimens to bring to class next week by using the instructions in Apologia's *Exploring Creation with Biology Lab 2.1*.

October 6: Module 3, Protist Kingdom

Students will learn about the unique organisms in Kingdom Protista by examining the pond/stream specimens they brought to class and also pond specimens provided by the teacher.

October 13: Module 4, Fungus Kingdom

Students will examine the anatomy of a club fungus. They will also look at fungal hyphae under the dissecting microscope and budding under the light microscope. We will experiment, by making homemade root beer, to see how some fungi can live anaerobically.

October 20: Module 5a, Chemistry of Life I

Students will construct molecular models to visualize photosynthesis. The four major classes of biomolecules will be discussed: proteins, carbohydrates, fats and nucleic acids.

October 27: Module 5b, Chemistry of Life II

We'll perform labs to identify the major food molecules, and we'll discuss the cell's plasma membrane and see diffusion and osmosis in action.

November 3: Module 6, The Cell

We will discuss prokaryotic vs. eukaryotic cells and plant vs. animal cells. Students will observe slides of many different kinds of cells. We will discuss the organelles in cells and draw a model of a cell.

November 10: Module 7a, Cellular Reproduction I

We'll isolate the DNA molecule from bananas. DNA replication, RNA transcription and translation to make amino acids will be discussed.

November 17: Module 7b, Cellular Reproduction II

The two types of cell reproduction, mitosis and meiosis, will be discussed and visualized through overhead diagrams and modeling. Students will take home an assignment to collect dominant and recessive phenotypes from family members.

No class November 24. Enjoy a blessed Thanksgiving with your family!

December 1: Module 8a, Genetics I

We'll examine the contribution Gregor Mendel made in the 1850's about how genes and traits are passed to the next generation. We'll examine our own phenotypes and genotypes for simple dominant traits and use Punnett squares to make hypothetical crosses.

No classes December 2–January 2. Enjoy an outstanding Christmas break with your family!!!

January 5: Module 8b, Genetics II

We'll expand on the Punnett square by making crosses of incompletely dominant traits and sex-linked traits. The significances of these traits will be discussed.

January 12: Module 9, Evolution

We'll discuss some of the theories of origins.

January 19: Module 10, Ecology

The following terms will be discussed and defined: ecosystem, population, community, organism, trophic level, niche, consumer, producer, herbivore, carnivore, omnivore, biotic factors, abiotic factors and watershed. We'll diagram abiotic cycles such as the water, carbon dioxide, nitrogen and phosphorous cycles.

January 26: Module 11a, Invertebrates of the Animal Kingdom I

Four types of symmetry in animals will be examined: spherical, radial, bilateral and asymmetrical. We'll look at slides of preserved sponges (poriferans) and hydra (cnidarians) under the microscope and discuss the polyp and medusa stages of cnidarians. We'll discuss the three types of worms (segmented, flat and round) and dissect the earthworm.

February 2: Module 11b, Invertebrates of the Animal Kingdom II

We'll use common animals to define dissection terms such as: anterior, posterior, caudal, dorsal, ventral. We'll discuss the echinoderm and the three classes of molluscs (gastropods, bivalves and cephalopods). Students will dissect a squid.

February 9: Module 12, Arthropods

All arthropods have jointed legs, segmented bodies and exoskeletons. We'll compare crayfish, spiders and insects. We'll discuss incomplete vs. complete metamorphosis and dissect the crayfish.

February 16: Module 13a, The Circulatory System

We'll take a little time here to talk about two-, three- and four-chambered hearts and how the circulatory system is interrelated with other systems, especially the respiratory system. We'll look at characteristics of amphibians.

February 23: Module 13b, Fish I

We'll examine the three classes of fish: agnatha, chondrichthyes and osteichthyes; and start dissecting the spiny dogfish shark.

March 2: Module 13c, Fish II

We'll finish our dissection of the shark.

March 9: Module 14, Plant Kingdom; Anatomy and Classification

Monocots differ from dicots in their stems, leaves, roots and seeds. These differences will be appreciated macroscopically and microscopically.

No classes March 12-16 because of Spring Break!

No classes March 19-23 because of Iowa Assessments.

No class March 30 because of Good Friday. Enjoy Easter with your family!

April 6: Module 15, Plant Kingdom; Physiology and Reproduction

We'll dissect flowers, the reproductive organs of flowering plants, and we'll examine many types of fruits.

April 13: Module 16a, Reptiles, Birds and Mammals I

We'll examine the amniotic egg, do Apologia Lab 16:1 about chick embryology and dissect the mammalian eyeball.

April 20: Wildflower Identification (This class may be moved up or down a week depending on weather.)

Students will meet at the upper playground area in Thomas Park (take the driveway to the left, then follow the drive as it curves around, up the hill to the right) & use provided wildflower keys to identify wildflowers in the woods. If it rains, we'll meet at the building. If in doubt, call the office at 373-9209.

April 27: Module 16b, Reptiles, Birds and Mammals II

We'll dissect the chicken wing, noting skin, muscles and bones and observe characteristics of reptiles, birds and mammals.

May 4: Human Physiology

This period will be used to make up for classes missed due to inclement winter weather, or students will participate in a variety of labs testing human body systems.

May 20, 2017