

MdBioLab

16-17 Laboratory Activities

9210 Corporate Blvd., Suite 470, Rockville, MD 20850
www.mdbiolab.org – info@mdbiolab.org – 240-243-4053

All laboratory activities are designed to help teachers address the Maryland Core Learning Goals in Science. Below is a list of the 16-17 school year activities available on the MdBioLab.

Activity	Summary
The Biodiesel Lab	<p>Students explore the process of preparing a clean renewable energy source by calculating the molarity of free fatty acids in vegetable oil using an acid/base titration. Recommended for AP Chemistry.</p> <p>Level: Advanced Focus: Chemistry, organic chemistry Time: 60 - 70 minutes Class size: 24 students</p>
Case of the Broken Beaker	<p>Students explore the connection between laboratory science and crime scene investigation by creating DNA profiles using restriction enzymes and agarose gel electrophoresis. Recommended for GT Biology and up and advanced Forensic classes.</p> <p>Level: Advanced Focus: Genetics, forensics Time: 70-90 minutes Class size: 32 students</p>
DNA Extraction	<p>Students explore the components of DNA while using the scientific method to determine whether the fruit from a plant is biotic or abiotic. Recommended for basic and remedial Biology classes.</p> <p>Level: Basic Focus: Cell biology Time: 50 minutes Class size: 32 students</p>
Looking into Lactase	<p>Students explore enzyme specificity and enzyme activity through an investigation into lactose intolerance and its symptoms. Recommended for all Biology classes.</p> <p>Level: Intermediate Focus: Cell biology and physiology Time: 60 - 70 minutes Class size: 32 students</p>

Mystery of the Crooked Cell Students explore the heredity of sickle cell disease by using gel electrophoresis to determine a patient's genotype for the hemoglobin gene. Recommended for all Biology classes.

Level: Intermediate

Focus: Genetics, cell biology and physiology

Time: 50 - 60 minutes

Class size: 32 students

Parasite Predicament Students explore the antigen-antibody relationship and complete an enzyme-linked immunosorbent assay (ELISA) to determine if a patient has contracted the malaria parasite. Recommended for AP Biology.

Level: Advanced

Focus: Immunology, biochemistry

Time: 45 - 60 minutes

Class size: 32 students

Transformation Lab Students explore the basic principles of genetic engineering by transforming *E. coli* cells with plasmids containing pFluoroGreen and ampicillin resistance genes. Recommended for AP Biology.

Level: Advanced

Focus: Genetics, DNA recombination, cell biology and physiology

Time: 55 minutes (must be in one continuous class)

Class size: 32 students

*Additional restrictions apply to the Transformation activity since it consists of multiple parts. Please contact your MdBioLab instructor if you are interested in this activity.

Wildlife Forensics Students explore the connection between laboratory science and environmental protection by analyzing amplified shark DNA using gel electrophoresis. Recommended for all Biology and Environmental Science classes.

Level: Intermediate

Focus: Genetics, forensics, environmental science, ecology

Time: 55 - 70 minutes

Class size: 32 students