

Middle School Laboratory Activities

Available for the *Gene Machine*, *Helix Express*, and Genetic Education Center

These lab skills activities and modules are designed to address basic biotechnology skills as well as career opportunities in the life sciences. Modules consist of background information, pre-lab questions, the lab activity protocol and post-lab questions. **Activities align and support the South Carolina Academic Standards and Performance Indicators for Science 2014.**

Module	Description	Technology	Objectives	Standard	SEPs
Seeing the Visible Spectrum: 50-60 minutes	Students learn the basics in micropipetting skills	Micropipetting	Introduce one of the basic biotechnology skills	7.S.1	7.S.1A.3 7.S.1A.5 7.S.1A.6
Gel Electrophoresis with Dyes: 50-60 minutes	Students perform simple gel electrophoresis and analysis to introduce this biotechnology tool	-Micropipetting -Gel electrophoresis	Basic biotechnology skills	7.S.1	7.S.1A.3 7.S.1A.4 7.S.1A.5 7.S.1A.6
Allergies-In a nutshell 50-60 minutes	Solve a mystery involving dinner out with the family and a severe allergic reaction	-Micropipetting -Gel electrophoresis	Molecular basis of life	7.S.1	7.S.1A.3 7.S.1A.4
Prion Diseases: Detection of Mad Cow Disease: 50-60 minutes	Determine which feed company is in violation of FDA regulations regarding the use of cattle tissue in all animal feed and pet food	-Micropipetting -DNA amplification through PCR -Gel electrophoresis	-Basic biotechnology skills -Molecular basis of life -Protein structure	7.L.3	7.L.3A.2 7.L.4A.5
DNA Isolation using Plants: 50-60 minutes	Students will isolate DNA from selected plants	-Micropipetting -DNA isolation	-DNA as code of life	7.L.4	7.L.4A.1
Chromosomes & Karyotypes: Be the Cytogeneticist 50-60 minutes	Students learn details regarding chromosomes, the karyotyping process, construct a karyotype and analyze for numerical or structural anomalies	-Construct karyotype	-Inheritance patterns -Molecular basis of life -Cell division	7.S.1 7.L.4	7.S.1A.2 7.S.1A.3 7.L.4A.1