Middle School Laboratory Activities

Available for the *Gene Machine* – Mobile Science Lab, Helix Express- Van, 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 College and Career-Ready Science Standards 2021

Module	Description	Technology	Objectives	Standard	DCIs
Sasha the Cat's Genetic Disguise 60 minutes	Students will explore the determination of calico cats using karyotype analysis and gel electrophoresis	--Micropipetting -Gel electrophoresis - Karyotypes	Inheritance and variation of traits	8-LS3-1 8-LS3-2 8-PS2-3	LS3.A LS3.B PS2.B
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 In the workplace	8-PSC-3	PS2.B
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	8-PS2-3 8-LS4-5	PS2.B LS4.B
Why do people look different? 60 minutes	Students will explore the connection between genotype and phenotype as related to the Mendelian inheritance of traits. Analyze a family for the genetics behind eye color.	-Micropipetting -Gel electrophoresis	-Basic biotechnology skills -Molecular basis of life -Trait inheritance -Punnett squares	8-LS3-1 8LS3-2 8-PS2-3	LS3.B LS1.B, LS3.A PS2.B
DNA Isolation 50-60 minutes	Students will isolate DNA from split peas	-Micropipetting -DNA isolation	-DNA as code of life	8-LS3-1	LS3.A LS3.B
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	8-LS3-1 *-LS3-2	LS3.A LS3.B LS1.B