INSTRUCTIONAL STAFF 2023
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Shane Parker, Ph.D., Assistant Professor, Department of Chemistry
Jim Bader, Department of Biology and Executive Director, Leonard Gelfand STEM Center

SCHEDULE
Monday July 17
Driving Question: What can fingerprints tell us about genetic variation within populations?
Learning Goals
- Model the integrations of science, engineering, and literacy.
- Explain how fingerprints are unique to an individual
- Draw together information from different sources and make logical deductions as a result
Activities
- Welcome, introductions, background, and context
- Pre-workshop assessments
- Science writing strategies
- Fingerprint science
- Daily assessment/reflection

Tuesday July 18
Driving Question: How can we use models to increase the efficiency of photo-chemical reactions?
Learning Goals
- Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.
- Make observations to provide evidence that energy can be transformed from one form to another.
- Recognize that models can be used to formulate explanations and generate predictions; specific types of models may even allow testing such predictions.
Activities
- Renewable energy experiments that include energy transformation
- Introduction to models and modeling
- Daily assessment/reflection
Wednesday July 19
Driving Question: What is in our genes and how do we make sure it stays safe?
Learning Goals
• Learn to use readily available materials to extract DNA from cells.
• Analyze and interpret data to provide evidence that plants and animals have traits inherited from parents and that variation of these traits exists in similar organisms
• Develop claims supported by evidence to defend an argument regarding the ethical use of genomic data

Activities
• DNA isolation
• Reebop reproduction
• Discussion – privacy and the ethical use of personal data
• Daily assessment/reflection

Thursday July 20 (Meet at Louis Stokes Cleveland VA Medical Center, 10701 East Blvd)
Driving Question: How can we, as biomedical engineers, restore limb functions for humans who have sustained injury?
Learning Goals
• Recognize the necessity for seamless integration of science and engineering to solve problems
• Apply scientific ideas to design, test, and refine a device that converts energy from one form to another

Activities
• Electromyography controlled foam hand
• Observation of stroke rehabilitation research study participants
• Daily assessment/reflection

Friday July 21
Driving Question: Is insect physiology changing as a consequence of contemporary range shifts?
Learning Goals
• Describe that organisms have unique and diverse life cycles but have in common birth, growth, reproduction, and death.
• Use evidence to support the claim that traits can be influenced by the environment

Activities
• Case quad scavenger hunt
• Closed system respirometry
• Daily assessment/reflection
• Post-workshop assessments