



Main Criteria: Nebraska Core Academic Content Standards

Secondary Criteria: JoVE

Subject: Science

Grade: 9-12

Correlation Options: Show Correlated

Adopted: 2010

CONTENT STANDARD	NE.SC 1:	INQUIRY, THE NATURE OF SCIENCE, AND TECHNOLOGY: Students will combine scientific processes and knowledge with scientific reasoning and critical thinking to ask questions about phenomena and propose explanations based on gathered evidence.
STRAND	1.1.	Abilities to do Scientific Inquiry
INDICATOR	12.1.1.	Students will design and conduct investigations that lead to the use of logic and evidence in the formulation of scientific explanations and models.
STRAND		Scientific Questioning
GRADE LEVEL EXPECTATION	12.1.1.a.	Formulate a testable hypothesis supported by prior knowledge to guide an investigation <u>JoVE</u> <ul style="list-style-type: none"> • The Multi-group Experiment • The Simple Experiment: Two-group Design
CONTENT STANDARD	NE.SC 1:	INQUIRY, THE NATURE OF SCIENCE, AND TECHNOLOGY: Students will combine scientific processes and knowledge with scientific reasoning and critical thinking to ask questions about phenomena and propose explanations based on gathered evidence.
STRAND	1.1.	Abilities to do Scientific Inquiry
INDICATOR	12.1.1.	Students will design and conduct investigations that lead to the use of logic and evidence in the formulation of scientific explanations and models.
STRAND		Scientific Investigations
GRADE LEVEL EXPECTATION	12.1.1.b.	Design and conduct logical and sequential scientific investigations with repeated trials and apply findings to new investigations <u>JoVE</u> <ul style="list-style-type: none"> • Ethics in Psychology Research • Experimentation using a Confederate

		<ul style="list-style-type: none"> • From Theory to Design: The Role of Creativity in Designing Experiments • Manipulating an Independent Variable through Embodiment • Observational Research • Pilot Testing • Placebos in Research • Realism in Experimentation • Reliability in Psychology Experiments • The Factorial Experiment • The Multi-group Experiment • The Simple Experiment: Two-group Design • Within-subjects Repeated-measures Design
CONTENT STANDARD	NE.SC 1:	INQUIRY, THE NATURE OF SCIENCE, AND TECHNOLOGY: Students will combine scientific processes and knowledge with scientific reasoning and critical thinking to ask questions about phenomena and propose explanations based on gathered evidence.
STRAND	1.1.	Abilities to do Scientific Inquiry
INDICATOR	12.1.1.	Students will design and conduct investigations that lead to the use of logic and evidence in the formulation of scientific explanations and models.
STRAND		Scientific Controls and Variables
GRADE LEVEL EXPECTATION	12.1.1.c.	Identify and manage variables and constraints <u>JoVE</u> <ul style="list-style-type: none"> • Calibration Curves • Ethics in Psychology Research • Experimentation using a Confederate • From Theory to Design: The Role of Creativity in Designing Experiments • Manipulating an Independent Variable through Embodiment • Observational Research • Pilot Testing • Placebos in Research • Realism in Experimentation • Reliability in Psychology Experiments • The Factorial Experiment • The Multi-group Experiment • The Simple Experiment: Two-group Design • Within-subjects Repeated-measures Design
CONTENT STANDARD	NE.SC 1:	INQUIRY, THE NATURE OF SCIENCE, AND TECHNOLOGY: Students will combine scientific processes and knowledge with scientific reasoning and critical thinking to ask questions about phenomena and propose explanations based on gathered evidence.
STRAND	1.1.	Abilities to do Scientific Inquiry

INDICATOR	12.1.1.	Students will design and conduct investigations that lead to the use of logic and evidence in the formulation of scientific explanations and models.
STRAND		Scientific Tools
GRADE LEVEL EXPECTATION	12.1.1.d.	<p>Select and use lab equipment and technology appropriately and accurately</p> <p><u>JoVE</u></p> <ul style="list-style-type: none"> • An Introduction to Working in the Hood • An Introduction to the Centrifuge • An Introduction to the Micropipettor • Common Lab Glassware and Uses • Histological Sample Preparation for Light Microscopy • Introduction to Fluorescence Microscopy • Introduction to Light Microscopy • Introduction to Serological Pipettes and Pipettors • Introduction to the Bunsen Burner • Introduction to the Microplate Reader • Introduction to the Spectrophotometer • Making Solutions in the Laboratory • Measuring Mass in the Laboratory • Regulating Temperature in the Lab: Applying Heat • Regulating Temperature in the Lab: Preserving Samples Using Cold • Understanding Concentration and Measuring Volumes
CONTENT STANDARD	NE.SC 1:	INQUIRY, THE NATURE OF SCIENCE, AND TECHNOLOGY: Students will combine scientific processes and knowledge with scientific reasoning and critical thinking to ask questions about phenomena and propose explanations based on gathered evidence.
STRAND	1.1.	Abilities to do Scientific Inquiry
INDICATOR	12.1.1.	Students will design and conduct investigations that lead to the use of logic and evidence in the formulation of scientific explanations and models.
STRAND		Scientific Observations
GRADE LEVEL EXPECTATION	12.1.1.e.	<p>Use tools and technology to make detailed qualitative and quantitative observations</p> <p><u>JoVE</u></p> <ul style="list-style-type: none"> • An Introduction to Working in the Hood • An Introduction to the Centrifuge • An Introduction to the Micropipettor • Common Lab Glassware and Uses • Community DNA Extraction from Bacterial Colonies • Conducting Reactions Below Room Temperature • Coordination Chemistry Complexes • Determination Of Nox in Automobile Exhaust Using UV-VIS Spectroscopy • Determining the Density of a Solid and Liquid • Determining the Empirical Formula

		<ul style="list-style-type: none"> • Freezing-Point Depression to Determine an Unknown Compound • Förster Resonance Energy Transfer (FRET) • Gas Chromatography (GC) with Flame-Ionization Detection • Growing Crystals for X-ray Diffraction Analysis • Histological Sample Preparation for Light Microscopy • Internal Standards • Introduction to Catalysis • Introduction to Fluorescence Microscopy • Introduction to Light Microscopy • Introduction to Mass Spectrometry • Introduction to Serological Pipettes and Pipettors • Introduction to the Bunsen Burner • Introduction to the Microplate Reader • Introduction to the Spectrophotometer • Lead Analysis of Soil Using Atomic Absorption Spectroscopy • MALDI-TOF Mass Spectrometry • Making Solutions in the Laboratory • Measuring Mass in the Laboratory • Metabolic Labeling • Method of Standard Addition • Nuclear Magnetic Resonance (NMR) Spectroscopy • Nutrients in Aquatic Ecosystems • Photometric Protein Determination • Plasmid Purification • Purifying Compounds by Recrystallization • Raman Spectroscopy for Chemical Analysis • Regulating Temperature in the Lab: Applying Heat • Regulating Temperature in the Lab: Preserving Samples Using Cold • Solid-Liquid Extraction • Spectrophotometric Determination of an Equilibrium Constant • Tandem Mass Spectrometry • Ultraviolet-Visible (UV-Vis) Spectroscopy • Understanding Concentration and Measuring Volumes • X-ray Fluorescence (XRF) • Yeast Maintenance
CONTENT STANDARD	NE.SC 1:	INQUIRY, THE NATURE OF SCIENCE, AND TECHNOLOGY: Students will combine scientific processes and knowledge with scientific reasoning and critical thinking to ask questions about phenomena and propose explanations based on gathered evidence.
STRAND	1.1.	Abilities to do Scientific Inquiry
INDICATOR	12.1.1.	Students will design and conduct investigations that lead to the use of logic and evidence in the formulation of scientific explanations and models.
STRAND		Scientific Communication

GRADE LEVEL EXPECTATION	12.1.1.k.	<p>Evaluate scientific investigations and offer revisions and new ideas as appropriate</p> <p><u>JoVE</u></p> <ul style="list-style-type: none"> • Aseptic Technique in Environmental Science • Calibration Curves • Capillary Electrophoresis (CE) • Chromatography-Based Biomolecule Purification Methods • Cyclic Voltammetry (CV) • Density Gradient Ultracentrifugation • Dialysis: Diffusion Based Separation • Electrochemical Measurements of Supported Catalysts Using a Potentiostat/Galvanostat • Ethics in Psychology Research • Experimentation using a Confederate • From Theory to Design: The Role of Creativity in Designing Experiments • Gas Chromatography (GC) with Flame-Ionization Detection • High-Performance Liquid Chromatography (HPLC) • Internal Standards • Introduction to Mass Spectrometry • Ion-Exchange Chromatography • Manipulating an Independent Variable through Embodiment • Method of Standard Addition • Observational Research • Pilot Testing • Placebos in Research • Preparing Anhydrous Reagents and Equipment • Protein Crystallization • Raman Spectroscopy for Chemical Analysis • Realism in Experimentation • Reliability in Psychology Experiments • Sample Preparation for Analytical Preparation • Scanning Electron Microscopy (SEM) • Self-report vs. Behavioral Measures of Recycling • The Factorial Experiment • The Multi-group Experiment • The Simple Experiment: Two-group Design • Two-Dimensional Gel Electrophoresis • Within-subjects Repeated-measures Design • X-ray Fluorescence (XRF)
CONTENT STANDARD	NE.SC 1:	INQUIRY, THE NATURE OF SCIENCE, AND TECHNOLOGY: Students will combine scientific processes and knowledge with scientific reasoning and critical thinking to ask questions about phenomena and propose explanations based on gathered evidence.
STRAND	1.1.	Abilities to do Scientific Inquiry

INDICATOR	12.1.1.	Students will design and conduct investigations that lead to the use of logic and evidence in the formulation of scientific explanations and models.
STRAND		Mathematics
GRADE LEVEL EXPECTATION	12.1.1.I.	<p>Use appropriate mathematics in all aspects of scientific inquiry</p> <p><u>JoVE</u></p> <ul style="list-style-type: none"> • Algae Enumeration via Culturable Methodology • An Introduction to Aging and Regeneration • An Introduction to Behavioral Neuroscience • An Introduction to Caenorhabditis elegans • An Introduction to Cell Division • An Introduction to Cell Metabolism • An Introduction to Cognition • An Introduction to Developmental Neurobiology • An Introduction to Drosophila melanogaster • An Introduction to Endocytosis and Exocytosis • An Introduction to Learning and Memory • An Introduction to Modeling Behavioral Disorders and Stress • An Introduction to Motor Control • An Introduction to Neurophysiology • An Introduction to Reward and Addiction • An Overview of Alkenone Biomarker Analysis for Paleothermometry • An Overview of Genetic Analysis • An Overview of Genetics and Disease • An Overview of bGDGT Biomarker Analysis for Paleoclimatology • Analysis of Earthworm Populations in Soil • Annexin V and Propidium Iodide Labeling • Anterograde Amnesia • Anxiety Testing • Approximate Number Sense Test • Are You Smart or Hardworking? How Praise Influences Children's Motivation • Assembly of a Reflux System for Heated Chemical Reactions • Assessing Dexterity with Reaching Tasks • Bacterial Growth Curve Analysis and its Environmental Applications • Balance and Coordination Testing • Basic Mouse Care and Maintenance • Binocular Rivalry • Biofuels: Producing Ethanol from Cellulosic Material • Blood Pressure Measurement • C. elegans Chemotaxis Assay • Calcium Imaging in Neurons • Calibration Curves • Capillary Electrophoresis (CE)

- Carbon and Nitrogen Analysis of Environmental Samples
- Categories and Inductive Inferences
- Cell Cycle Analysis
- Cell-surface Biotinylation Assay
- Children's Reliance on Artist Intentions When Identifying Pictures
- Chromatin Immunoprecipitation
- Chromatography-Based Biomolecule Purification Methods
- Co-Immunoprecipitation and Pull-Down Assays
- Column Chromatography
- Community DNA Extraction from Bacterial Colonies
- Conducting Reactions Below Room Temperature
- Conversion of Fatty Acid Methyl Esters by Saponification for Uk'37 Paleothermometry
- Coordination Chemistry Complexes
- Crowding
- Culturing and Enumerating Bacteria from Soil Samples
- Cyclic Voltammetry (CV)
- DNA Methylation Analysis
- Decision-making and the Iowa Gambling Task
- Decoding Auditory Imagery with Multivoxel Pattern Analysis
- Degassing Liquids with Freeze-Pump-Thaw Cycling
- Density Gradient Ultracentrifugation
- Detecting Environmental Microorganisms with the Polymerase Chain Reaction and Gel Electrophoresis
- Detecting Reactive Oxygen Species
- Determination Of Nox in Automobile Exhaust Using UV-VIS Spectroscopy
- Determination of Moisture Content in Soil
- Determining Rate Laws and the Order of Reaction
- Determining Spatial Orientation of Rock Layers with the Brunton Compass
- Determining the Density of a Solid and Liquid
- Determining the Empirical Formula
- Determining the Mass Percent Composition in an Aqueous Solution
- Determining the Solubility Rules of Ionic Compounds
- Development and Reproduction of the Laboratory Mouse
- Dialysis: Diffusion Based Separation
- Dichotic Listening
- Dissolved Oxygen in Surface Water
- Drosophila Development and Reproduction
- Electro-encephalography (EEG)
- Electrochemical Measurements of Supported Catalysts Using a Potentiostat/Galvanostat
- Electrophoretic Mobility Shift Assay (EMSA)
- Enzyme Assays and Kinetics
- Ethics in Psychology Research

- **Event-related Potentials and the Oddball Task**
- **Executive Function and the Dimensional Change Card Sort Task**
- **Executive Function in Autism Spectrum Disorder**
- **Experimentation using a Confederate**
- **Expression Profiling with Microarrays**
- **Extraction of Biomarkers from Sediments - Accelerated Solvent Extraction**
- **Eye Tracking in Cognitive Experiments**
- **FM Dyes in Vesicle Recycling**
- **Fate Mapping**
- **Fear Conditioning**
- **Fractional Distillation**
- **Freezing-Point Depression to Determine an Unknown Compound**
- **From Theory to Design: The Role of Creativity in Designing Experiments**
- **Förster Resonance Energy Transfer (FRET)**
- **Gas Chromatography (GC) with Flame-Ionization Detection**
- **Gene Silencing with Morpholinos**
- **Genetic Crosses**
- **Genetic Screens**
- **Growing Crystals for X-ray Diffraction Analysis**
- **Habituation: Studying Infants Before They Can Talk**
- **High-Performance Liquid Chromatography (HPLC)**
- **How Children Solve Problems Using Causal Reasoning**
- **Ideal Gas Law**
- **Inattentive Blindness**
- **Incidental Encoding**
- **Internal Standards**
- **Introducing Experimental Agents into the Mouse**
- **Introduction to Catalysis**
- **Introduction to Mass Spectrometry**
- **Introduction to Titration**
- **Introduction to the Microplate Reader**
- **Introduction to the Spectrophotometer**
- **Invasion Assay Using 3D Matrices**
- **Invertebrate Lifespan Quantification**
- **Ion-Exchange Chromatography**
- **Isolating Nucleic Acids from Yeast**
- **Just-noticeable Differences**
- **Language: The N400 in Semantic Incongruity**
- **Le Châtelier's Principle**
- **Lead Analysis of Soil Using Atomic Absorption Spectroscopy**
- **Learning and Memory: The Remember-Know Task**
- **MALDI-TOF Mass Spectrometry**
- **Making Solutions in the Laboratory**
- **Making a Geologic Cross Section**
- **Manipulating an Independent Variable through Embodiment**

- Measuring Children's Trust in Testimony
- Measuring Grey Matter Differences with Voxel-based Morphometry: The Musical Brain
- Measuring Reaction Time and Donders' Method of Subtraction
- Measuring Tropospheric Ozone
- Measuring Verbal Working Memory Span
- Measuring Vital Signs
- Memory Development: Demonstrating How Repeated Questioning Leads to False Memories
- Mental Rotation
- Metabolic Labeling
- Metacognitive Development: How Children Estimate Their Memory
- Method of Standard Addition
- Modeling Social Stress
- Motion-induced Blindness
- Motor Learning in Mirror Drawing
- Motor Maps
- Multiple Object Tracking
- Mutual Exclusivity: How Children Learn the Meanings of Words
- Nuclear Magnetic Resonance (NMR) Spectroscopy
- Numerical Cognition: More or Less
- Nutrients in Aquatic Ecosystems
- Object Substitution Masking
- Observational Research
- PCR: The Polymerase Chain Reaction
- Patch Clamp Electrophysiology
- Performing 1D Thin Layer Chromatography
- Pericardiocentesis
- Peripheral Vascular Exam Using a Continuous Wave Doppler
- Perspectives on Cognitive Psychology
- Perspectives on Neuropsychology
- Photometric Protein Determination
- Physical Properties Of Minerals I: Crystals and Cleavage
- Physical Properties Of Minerals II: Polymineralic Analysis
- Physiological Correlates of Emotion Recognition
- Piaget's Conservation Task and the Influence of Task Demands
- Pilot Testing
- Placebos in Research
- Plasmid Purification
- Positive Reinforcement Studies
- Preparing Anhydrous Reagents and Equipment
- Prospect Theory
- Protein Crystallization
- Proton Exchange Membrane Fuel Cells
- Purification of a Total Lipid Extract with Column Chromatography

- Purifying Compounds by Recrystallization
- Quantifying Environmental Microorganisms and Viruses Using qPCR
- RNA Analysis of Environmental Samples Using RT-PCR
- RNA-Seq
- RNAi in *C. elegans*
- Raman Spectroscopy for Chemical Analysis
- Realism in Experimentation
- Reconstitution of Membrane Proteins
- Reliability in Psychology Experiments
- Removal of Branched and Cyclic Compounds by Urea Adduction for Uk'37 Paleothermometry
- Rotary Evaporation to Remove Solvent
- SNP Genotyping
- Sample Preparation for Analytical Preparation
- Scanning Electron Microscopy (SEM)
- Schlenk Lines Transfer of Solvents
- Self-administration Studies
- Self-report vs. Behavioral Measures of Recycling
- Separation of Mixtures via Precipitation
- Soil Nutrient Analysis: Nitrogen, Phosphorus, and Potassium
- Solid-Liquid Extraction
- Solutions and Concentrations
- Sonication Extraction of Lipid Biomarkers from Sediment
- Soxhlet Extraction of Lipid Biomarkers from Sediment
- Spatial Cueing
- Spatial Memory Testing Using Mazes
- Spectrophotometric Determination of an Equilibrium Constant
- Surface Plasmon Resonance (SPR)
- Tandem Mass Spectrometry
- Testing For Genetically Modified Foods
- The ATP Bioluminescence Assay
- The Attentional Blink
- The Costs and Benefits of Natural Pedagogy
- The ELISA Method
- The Factorial Experiment
- The Ideal Gas Law
- The Inverted-face Effect
- The Morris Water Maze
- The Multi-group Experiment
- The Precision of Visual Working Memory with Delayed Estimation
- The Rouge Test: Searching for a Sense of Self
- The Simple Experiment: Two-group Design
- The Split Brain
- The Staircase Procedure for Finding a Perceptual Threshold
- The TUNEL Assay
- The Transwell Migration Assay

		<ul style="list-style-type: none"> • The Western Blot • Tree Identification: How To Use a Dichotomous Key • Tree Survey: Point-Centered Quarter Sampling Method • Turbidity and Total Solids in Surface Water • Two-Dimensional Gel Electrophoresis • Ultraviolet-Visible (UV-Vis) Spectroscopy • Understanding Concentration and Measuring Volumes • Using Differential Scanning Calorimetry to Measure Changes in Enthalpy • Using Diffusion Tensor Imaging in Traumatic Brain Injury • Using GIS to Investigate Urban Forestry • Using TMS to Measure Motor Excitability During Action Observation • Using Your Head: Measuring Infants' Rational Imitation of Actions • Using a pH Meter • Verbal Priming • Visual Attention: fMRI Investigation of Object-based Attentional Control • Visual Search for Features and Conjunctions • Visual Statistical Learning • Visualizing Soil Microorganisms via the Contact Slide Assay and Microscopy • Water Quality Analysis via Indicator Organisms • Within-subjects Repeated-measures Design • X-ray Fluorescence (XRF) • Yeast Maintenance • fMRI: Functional Magnetic Resonance Imaging
CONTENT STANDARD	NE.SC 1:	INQUIRY, THE NATURE OF SCIENCE, AND TECHNOLOGY: Students will combine scientific processes and knowledge with scientific reasoning and critical thinking to ask questions about phenomena and propose explanations based on gathered evidence.
STRAND	1.2.	Nature of Science
INDICATOR	12.1.2.	Students will apply the nature of scientific knowledge to their own investigations and in the evaluation of scientific explanations.
STRAND		Science and Society
GRADE LEVEL EXPECTATION	12.1.2.b.	<p>Describe how society influences the work of scientists and how science, technology, and current scientific discoveries influence and change society</p> <p><u>JoVE</u></p> <ul style="list-style-type: none"> • Abdominal Exam I: Inspection and Auscultation • Abdominal Exam IV: Acute Abdominal Pain Assessment • Algae Enumeration via Culturable Methodology • An Introduction to Aging and Regeneration • An Introduction to Behavioral Neuroscience

- An Introduction to Cell Death
- An Introduction to Cell Division
- An Introduction to Cell Metabolism
- An Introduction to Cell Motility and Migration
- An Introduction to Cognition
- An Introduction to Developmental Neurobiology
- An Introduction to *Drosophila melanogaster*
- An Introduction to Endocytosis and Exocytosis
- An Introduction to Learning and Memory
- An Introduction to Motor Control
- An Introduction to Neuroanatomy
- An Introduction to Neurophysiology
- An Introduction to Organogenesis
- An Introduction to Reward and Addiction
- An Introduction to *Saccharomyces cerevisiae*
- An Introduction to Stem Cell Biology
- An Introduction to Transfection
- An Introduction to the Centrifuge
- An Introduction to the Laboratory Mouse: *Mus musculus*
- An Introduction to the Micropipettor
- An Overview of Alkenone Biomarker Analysis for Paleothermometry
- An Overview of Epigenetics
- An Overview of Genetic Analysis
- An Overview of Genetic Engineering
- An Overview of Genetics and Disease
- An Overview of bGDGT Biomarker Analysis for Paleoclimatology
- Anesthesia Induction and Maintenance
- Annexin V and Propidium Iodide Labeling
- Arterial Line Placement
- Assembly of a Reflux System for Heated Chemical Reactions
- Auscultation
- Bacterial Growth Curve Analysis and its Environmental Applications
- Bacterial Transformation: Electroporation
- Bacterial Transformation: The Heat Shock Method
- Basic Life Support: Cardiopulmonary Resuscitation and Defibrillation
- Biofuels: Producing Ethanol from Cellulosic Material
- Blood Pressure Measurement
- Blood Withdrawal I
- Blood Withdrawal II
- Calcium Imaging in Neurons
- Calibration Curves
- Capillary Electrophoresis (CE)
- Carbon and Nitrogen Analysis of Environmental Samples
- Cardiac Exam II: Auscultation
- Cardiac Exam III: Abnormal Heart Sounds

- Cell Cycle Analysis
- Cell-surface Biotinylation Assay
- Central Venous Catheter Insertion: Femoral Vein with Ultrasound Guidance
- Central Venous Catheter Insertion: Internal Jugular with Ultrasound Guidance
- Central Venous Catheter Insertion: Subclavian Vein
- Chromatin Immunoprecipitation
- Chromatography-Based Biomolecule Purification Methods
- Co-Immunoprecipitation and Pull-Down Assays
- Color Afterimages
- Column Chromatography
- Common Lab Glassware and Uses
- Community DNA Extraction from Bacterial Colonies
- Compound Administration I
- Compound Administration II
- Compound Administration III
- Compound Administration IV
- Conducting Reactions Below Room Temperature
- Considerations for Rodent Surgery
- Conversion of Fatty Acid Methyl Esters by Saponification for Uk'37 Paleothermometry
- Coordination Chemistry Complexes
- Cranial Nerves Exam I (I-VI)
- Cranial Nerves Exam II (VII-XII)
- Crowding
- Culturing and Enumerating Bacteria from Soil Samples
- Cyclic Voltammetry (CV)
- Cytogenetics
- DNA Gel Electrophoresis
- DNA Ligation Reactions
- DNA Methylation Analysis
- Decision-making and the Iowa Gambling Task
- Decoding Auditory Imagery with Multivoxel Pattern Analysis
- Degassing Liquids with Freeze-Pump-Thaw Cycling
- Density Gradient Ultracentrifugation
- Detecting Environmental Microorganisms with the Polymerase Chain Reaction and Gel Electrophoresis
- Detecting Reactive Oxygen Species
- Detection of Bacteriophages in Environmental Samples
- Determination Of Nox in Automobile Exhaust Using UV-VIS Spectroscopy
- Determining Rate Laws and the Order of Reaction
- Determining Spatial Orientation of Rock Layers with the Brunton Compass
- Determining the Density of a Solid and Liquid
- Determining the Empirical Formula
- Determining the Mass Percent Composition in an Aqueous Solution
- Determining the Solubility Rules of Ionic Compounds

- Diagnostic Necropsy and Tissue Harvest
- Dialysis: Diffusion Based Separation
- Dissolved Oxygen in Surface Water
- Ear Exam
- Electro-encephalography (EEG)
- Electrochemical Measurements of Supported Catalysts Using a Potentiostat/Galvanostat
- Electrophoretic Mobility Shift Assay (EMSA)
- Embryonic Stem Cell Culture and Differentiation
- Emergency Tube Thoracostomy (Chest Tube Placement)
- Emergent Lateral Canthotomy and Inferior Catholysis
- Enzyme Assays and Kinetics
- Event-related Potentials and the Oddball Task
- Explant Culture of Neural Tissue
- Expression Profiling with Microarrays
- Extraction of Biomarkers from Sediments - Accelerated Solvent Extraction
- Eye Exam
- Eye Tracking in Cognitive Experiments
- FM Dyes in Vesicle Recycling
- Fate Mapping
- Fear Conditioning
- Finding Your Blind Spot and Perceptual Filling-in
- Fractional Distillation
- Freezing-Point Depression to Determine an Unknown Compound
- Förster Resonance Energy Transfer (FRET)
- Gas Chromatography (GC) with Flame-Ionization Detection
- Gel Purification
- General Approach to the Physical Exam
- Genetic Crosses
- Genetic Engineering of Model Organisms
- Genetic Screens
- Genome Editing
- Gram Staining of Bacteria from Environmental Sources
- Growing Crystals for X-ray Diffraction Analysis
- High-Performance Liquid Chromatography (HPLC)
- Histological Sample Preparation for Light Microscopy
- Histological Staining of Neural Tissue
- Ideal Gas Law
- Induced Pluripotency
- Internal Standards
- Intra-articular Shoulder Injection for Reduction Following Anterior Shoulder Dislocation
- Intraosseous Needle Placement
- Introduction to Catalysis
- Introduction to Fluorescence Microscopy
- Introduction to Light Microscopy
- Introduction to Mass Spectrometry
- Introduction to Serological Pipettes and Pipettors

- Introduction to Titration
- Introduction to the Spectrophotometer
- Invasion Assay Using 3D Matrices
- Ion-Exchange Chromatography
- Isolation of Fecal Bacteria from Water Samples by Filtration
- Language: The N400 in Semantic Incongruity
- Le Châtelier's Principle
- Lead Analysis of Soil Using Atomic Absorption Spectroscopy
- Learning and Memory: The Remember-Know Task
- Live Cell Imaging of Mitosis
- MALDI-TOF Mass Spectrometry
- Making Solutions in the Laboratory
- Measuring Grey Matter Differences with Voxel-based Morphometry: The Musical Brain
- Measuring Mass in the Laboratory
- Measuring Tropospheric Ozone
- Measuring Vital Signs
- Metabolic Labeling
- Method of Standard Addition
- Molecular Cloning
- Motion-induced Blindness
- Motor Exam II
- Motor Maps
- Murine In Utero Electroporation
- Needle Thoracostomy (needle Decompression) for Temporizing Tension Pneumothorax Treatment
- Nose, Sinuses, Oral Cavity and Pharynx Exam
- Nuclear Magnetic Resonance (NMR) Spectroscopy
- Nutrients in Aquatic Ecosystems
- Object Substitution Masking
- Ophthalmoscopic Examination
- PCR: The Polymerase Chain Reaction
- Passaging Cells
- Patch Clamp Electrophysiology
- Pelvic Exam II: Speculum Exam
- Pelvic Exam III: Bimanual and Rectovaginal Exam
- Percussion
- Percutaneous Cricothyrotomy (Seldinger Technique)
- Performing 1D Thin Layer Chromatography
- Pericardiocentesis
- Peripheral Vascular Exam
- Peripheral Vascular Exam Using a Continuous Wave Doppler
- Peripheral Venous Cannulation
- Photometric Protein Determination
- Physical Properties Of Minerals I: Crystals and Cleavage
- Physical Properties Of Minerals II: Polymineralic Analysis
- Physiological Correlates of Emotion Recognition
- Plasmid Purification

- Positive Reinforcement Studies
- Preparing Anhydrous Reagents and Equipment
- Protein Crystallization
- Proton Exchange Membrane Fuel Cells
- Purification of a Total Lipid Extract with Column Chromatography
- Purifying Compounds by Recrystallization
- Quantifying Environmental Microorganisms and Viruses Using qPCR
- RNA-Seq
- Raman Spectroscopy for Chemical Analysis
- Recombineering and Gene Targeting
- Reconstitution of Membrane Proteins
- Regulating Temperature in the Lab: Applying Heat
- Regulating Temperature in the Lab: Preserving Samples Using Cold
- Removal of Branched and Cyclic Compounds by Urea Adduction for Uk'37 Paleothermometry
- Respiratory Exam II: Percussion and Auscultation
- Restriction Enzyme Digests
- Rodent Stereotaxic Surgery
- Rotary Evaporation to Remove Solvent
- SNP Genotyping
- Sample Preparation for Analytical Preparation
- Scanning Electron Microscopy (SEM)
- Schlenk Lines Transfer of Solvents
- Self-administration Studies
- Separating Protein with SDS-PAGE
- Separation of Mixtures via Precipitation
- Soil Nutrient Analysis: Nitrogen, Phosphorus, and Potassium
- Solid-Liquid Extraction
- Solutions and Concentrations
- Sonication Extraction of Lipid Biomarkers from Sediment
- Soxhlet Extraction of Lipid Biomarkers from Sediment
- Spatial Cueing
- Spectrophotometric Determination of an Equilibrium Constant
- Sterile Tissue Harvest
- Surface Plasmon Resonance (SPR)
- Surgical Cricothyrotomy
- Tandem Mass Spectrometry
- Testing For Genetically Modified Foods
- The ATP Bioluminescence Assay
- The Attentional Blink
- The ELISA Method
- The Ideal Gas Law
- The Rubber Hand Illusion
- The TUNEL Assay
- The Transwell Migration Assay
- The Western Blot

		<ul style="list-style-type: none"> • Tissue Regeneration with Somatic Stem Cells • Transplantation Studies • Turbidity and Total Solids in Surface Water • Two-Dimensional Gel Electrophoresis • Ultraviolet-Visible (UV-Vis) Spectroscopy • Understanding Concentration and Measuring Volumes • Using Differential Scanning Calorimetry to Measure Changes in Enthalpy • Using Diffusion Tensor Imaging in Traumatic Brain Injury • Using GIS to Investigate Urban Forestry • Using TMS to Measure Motor Excitability During Action Observation • Using a pH Meter • Visual Attention: fMRI Investigation of Object-based Attentional Control • X-ray Fluorescence (XRF) • Yeast Transformation and Cloning • fMRI: Functional Magnetic Resonance Imaging
CONTENT STANDARD	NE.SC 1:	INQUIRY, THE NATURE OF SCIENCE, AND TECHNOLOGY: Students will combine scientific processes and knowledge with scientific reasoning and critical thinking to ask questions about phenomena and propose explanations based on gathered evidence.
STRAND	1.2.	Nature of Science
INDICATOR	12.1.2.	Students will apply the nature of scientific knowledge to their own investigations and in the evaluation of scientific explanations.
STRAND		Science as a Human Endeavor
GRADE LEVEL EXPECTATION	12.1.2.c.	<p>Recognize that the work of science results in incremental advances, almost always building on prior knowledge, in our understanding of the world</p> <p><u>JoVE</u></p> <ul style="list-style-type: none"> • Abdominal Exam II: Percussion • An Introduction to Aging and Regeneration • An Introduction to Behavioral Neuroscience • An Introduction to Caenorhabditis elegans • An Introduction to Cell Death • An Introduction to Cell Division • An Introduction to Cell Metabolism • An Introduction to Cell Motility and Migration • An Introduction to Developmental Genetics • An Introduction to Developmental Neurobiology • An Introduction to Drosophila melanogaster • An Introduction to Endocytosis and Exocytosis • An Introduction to Learning and Memory • An Introduction to Molecular Developmental Biology • An Introduction to Neuroanatomy • An Introduction to Neurophysiology

		<ul style="list-style-type: none"> • An Introduction to Organogenesis • An Introduction to <i>Saccharomyces cerevisiae</i> • An Introduction to Stem Cell Biology • An Introduction to the Chick: <i>Gallus gallus domesticus</i> • An Introduction to the Laboratory Mouse: <i>Mus musculus</i> • An Introduction to the Zebrafish: <i>Danio rerio</i> • An Overview of Epigenetics • An Overview of Gene Expression • An Overview of Genetic Analysis • An Overview of Genetic Engineering • An Overview of Genetics and Disease • Anterograde Amnesia • Auscultation • <i>C. elegans</i> Maintenance • Cell Cycle Analysis • Color Afterimages • Determining Spatial Orientation of Rock Layers with the Brunton Compass • Development of the Chick • <i>Drosophila</i> Maintenance • General Approach to the Physical Exam • Genetic Crosses • Inattentional Blindness • Le Châtelier's Principle • Making a Geologic Cross Section • Measuring Reaction Time and Donders' Method of Subtraction • Motion-induced Blindness • Object Substitution Masking • Percussion • Piaget's Conservation Task and the Influence of Task Demands • Rotary Evaporation to Remove Solvent • Spatial Cueing • The Attentional Blink • The Rubber Hand Illusion • The Split Brain • Visualizing Soil Microorganisms via the Contact Slide Assay and Microscopy • Yeast Transformation and Cloning
GRADE LEVEL EXPECTATION	12.1.2.d.	<p>Research and describe the difficulties experienced by scientific innovators who had to overcome commonly held beliefs of their times to reach conclusions that we now take for granted</p> <p><u>JoVE</u></p> <ul style="list-style-type: none"> • Abdominal Exam II: Percussion • An Introduction to Aging and Regeneration • An Introduction to Behavioral Neuroscience • An Introduction to <i>Caenorhabditis elegans</i>

- An Introduction to Cell Death
- An Introduction to Cell Division
- An Introduction to Cell Metabolism
- An Introduction to Cell Motility and Migration
- An Introduction to Developmental Genetics
- An Introduction to Developmental Neurobiology
- An Introduction to Drosophila melanogaster
- An Introduction to Endocytosis and Exocytosis
- An Introduction to Molecular Developmental Biology
- An Introduction to Neuroanatomy
- An Introduction to Neurophysiology
- An Introduction to Organogenesis
- An Introduction to Saccharomyces cerevisiae
- An Introduction to Stem Cell Biology
- An Introduction to the Chick: Gallus gallus domesticus
- An Introduction to the Laboratory Mouse: Mus musculus
- An Introduction to the Zebrafish: Danio rerio
- An Overview of Epigenetics
- An Overview of Gene Expression
- An Overview of Genetic Analysis
- An Overview of Genetic Engineering
- An Overview of Genetics and Disease
- Anterograde Amnesia
- Auscultation
- C. elegans Maintenance
- Color Afterimages
- Degassing Liquids with Freeze-Pump-Thaw Cycling
- Determining Spatial Orientation of Rock Layers with the Brunton Compass
- Development of the Chick
- General Approach to the Physical Exam
- Genetic Crosses
- Ideal Gas Law
- Inattentive Blindness
- Le Châtelier's Principle
- Making a Geologic Cross Section
- Measuring Reaction Time and Donders' Method of Subtraction
- Motion-induced Blindness
- Object Substitution Masking
- Passaging Cells
- Percussion
- Piaget's Conservation Task and the Influence of Task Demands
- Rotary Evaporation to Remove Solvent
- Schlenk Lines Transfer of Solvents
- Spatial Cueing
- The Attentional Blink
- The Ideal Gas Law
- The Rubber Hand Illusion

		<ul style="list-style-type: none"> • The Split Brain • Visualizing Soil Microorganisms via the Contact Slide Assay and Microscopy
CONTENT STANDARD	NE.SC 1:	INQUIRY, THE NATURE OF SCIENCE, AND TECHNOLOGY: Students will combine scientific processes and knowledge with scientific reasoning and critical thinking to ask questions about phenomena and propose explanations based on gathered evidence.
STRAND	1.3.	Technology
INDICATOR	12.1.3.	Students will solve a complex design problem.
STRAND		Understanding of Technical Design
GRADE LEVEL EXPECTATION	12.1.3.f.	<p>Compare and contrast the reasons for the pursuit of science and the pursuit of technology</p> <p><u>JoVE</u></p> <ul style="list-style-type: none"> • Abdominal Exam I: Inspection and Auscultation • Abdominal Exam IV: Acute Abdominal Pain Assessment • Algae Enumeration via Culturable Methodology • An Introduction to Aging and Regeneration • An Introduction to Behavioral Neuroscience • An Introduction to Cell Death • An Introduction to Cell Division • An Introduction to Cell Metabolism • An Introduction to Cell Motility and Migration • An Introduction to Cognition • An Introduction to Developmental Neurobiology • An Introduction to Drosophila melanogaster • An Introduction to Endocytosis and Exocytosis • An Introduction to Learning and Memory • An Introduction to Motor Control • An Introduction to Neuroanatomy • An Introduction to Neurophysiology • An Introduction to Organogenesis • An Introduction to Reward and Addiction • An Introduction to Saccharomyces cerevisiae • An Introduction to Stem Cell Biology • An Introduction to Transfection • An Introduction to the Centrifuge • An Introduction to the Laboratory Mouse: Mus musculus • An Introduction to the Micropipettor • An Overview of Alkenone Biomarker Analysis for Paleothermometry • An Overview of Epigenetics • An Overview of Genetic Analysis • An Overview of Genetic Engineering • An Overview of Genetics and Disease • An Overview of bGDGT Biomarker Analysis for Paleoclimatology

- Anesthesia Induction and Maintenance
- Annexin V and Propidium Iodide Labeling
- Arterial Line Placement
- Assembly of a Reflux System for Heated Chemical Reactions
- Auscultation
- Bacterial Growth Curve Analysis and its Environmental Applications
- Bacterial Transformation: Electroporation
- Bacterial Transformation: The Heat Shock Method
- Basic Life Support: Cardiopulmonary Resuscitation and Defibrillation
- Biofuels: Producing Ethanol from Cellulosic Material
- Blood Pressure Measurement
- Blood Withdrawal I
- Blood Withdrawal II
- Calcium Imaging in Neurons
- Calibration Curves
- Capillary Electrophoresis (CE)
- Carbon and Nitrogen Analysis of Environmental Samples
- Cardiac Exam II: Auscultation
- Cardiac Exam III: Abnormal Heart Sounds
- Cell Cycle Analysis
- Cell-surface Biotinylation Assay
- Central Venous Catheter Insertion: Femoral Vein with Ultrasound Guidance
- Central Venous Catheter Insertion: Internal Jugular with Ultrasound Guidance
- Central Venous Catheter Insertion: Subclavian Vein
- Chromatin Immunoprecipitation
- Chromatography-Based Biomolecule Purification Methods
- Co-Immunoprecipitation and Pull-Down Assays
- Color Afterimages
- Column Chromatography
- Common Lab Glassware and Uses
- Community DNA Extraction from Bacterial Colonies
- Compound Administration I
- Compound Administration II
- Compound Administration III
- Compound Administration IV
- Conducting Reactions Below Room Temperature
- Considerations for Rodent Surgery
- Conversion of Fatty Acid Methyl Esters by Saponification for Uk'37 Paleothermometry
- Coordination Chemistry Complexes
- Cranial Nerves Exam I (I-VI)
- Cranial Nerves Exam II (VII-XII)
- Crowding
- Culturing and Enumerating Bacteria from Soil Samples
- Cyclic Voltammetry (CV)

- Cytogenetics
- DNA Gel Electrophoresis
- DNA Ligation Reactions
- DNA Methylation Analysis
- Decision-making and the Iowa Gambling Task
- Decoding Auditory Imagery with Multivoxel Pattern Analysis
- Degassing Liquids with Freeze-Pump-Thaw Cycling
- Density Gradient Ultracentrifugation
- Detecting Environmental Microorganisms with the Polymerase Chain Reaction and Gel Electrophoresis
- Detecting Reactive Oxygen Species
- Detection of Bacteriophages in Environmental Samples
- Determination Of Nox in Automobile Exhaust Using UV-VIS Spectroscopy
- Determining Rate Laws and the Order of Reaction
- Determining Spatial Orientation of Rock Layers with the Brunton Compass
- Determining the Density of a Solid and Liquid
- Determining the Empirical Formula
- Determining the Mass Percent Composition in an Aqueous Solution
- Determining the Solubility Rules of Ionic Compounds
- Diagnostic Necropsy and Tissue Harvest
- Dialysis: Diffusion Based Separation
- Dissolved Oxygen in Surface Water
- Ear Exam
- Electro-encephalography (EEG)
- Electrochemical Measurements of Supported Catalysts Using a Potentiostat/Galvanostat
- Electrophoretic Mobility Shift Assay (EMSA)
- Embryonic Stem Cell Culture and Differentiation
- Emergency Tube Thoracostomy (Chest Tube Placement)
- Emergent Lateral Canthotomy and Inferior Catholysis
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- Event-related Potentials and the Oddball Task
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- Eye Tracking in Cognitive Experiments
- FM Dyes in Vesicle Recycling
- Fate Mapping
- Fear Conditioning
- Finding Your Blind Spot and Perceptual Filling-in
- Fractional Distillation
- Freezing-Point Depression to Determine an Unknown Compound
- Förster Resonance Energy Transfer (FRET)
- Gas Chromatography (GC) with Flame-Ionization

Detection

- Gel Purification
- General Approach to the Physical Exam
- Genetic Crosses
- Genetic Engineering of Model Organisms
- Genetic Screens
- Genome Editing
- Gram Staining of Bacteria from Environmental Sources
- Growing Crystals for X-ray Diffraction Analysis
- High-Performance Liquid Chromatography (HPLC)
- Histological Sample Preparation for Light Microscopy
- Histological Staining of Neural Tissue
- Ideal Gas Law
- Induced Pluripotency
- Internal Standards
- Intra-articular Shoulder Injection for Reduction

Following Anterior Shoulder Dislocation

- Intraosseous Needle Placement
- Introduction to Catalysis
- Introduction to Fluorescence Microscopy
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- Introduction to Mass Spectrometry
- Introduction to Serological Pipettes and Pipettors
- Introduction to Titration
- Introduction to the Spectrophotometer
- Invasion Assay Using 3D Matrices
- Ion-Exchange Chromatography
- Isolation of Fecal Bacteria from Water Samples by Filtration

- Language: The N400 in Semantic Incongruity
- Le Châtelier's Principle
- Lead Analysis of Soil Using Atomic Absorption

Spectroscopy

- Learning and Memory: The Remember-Know Task
- Live Cell Imaging of Mitosis
- MALDI-TOF Mass Spectrometry
- Making Solutions in the Laboratory
- Measuring Grey Matter Differences with Voxel-based

Morphometry: The Musical Brain

- Measuring Mass in the Laboratory
- Measuring Tropospheric Ozone
- Measuring Vital Signs
- Metabolic Labeling
- Method of Standard Addition
- Molecular Cloning
- Motion-induced Blindness
- Motor Exam II
- Motor Maps
- Murine In Utero Electroporation
- Needle Thoracostomy (needle Decompression) for Temporizing Tension Pneumothorax Treatment
- Nose, Sinuses, Oral Cavity and Pharynx Exam

- Nuclear Magnetic Resonance (NMR) Spectroscopy
- Nutrients in Aquatic Ecosystems
- Object Substitution Masking
- Ophthalmoscopic Examination
- PCR: The Polymerase Chain Reaction
- Passaging Cells
- Patch Clamp Electrophysiology
- Pelvic Exam II: Speculum Exam
- Pelvic Exam III: Bimanual and Rectovaginal Exam
- Percussion
- Percutaneous Cricothyrotomy (Seldinger Technique)
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- Pericardiocentesis
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- Peripheral Vascular Exam Using a Continuous Wave Doppler
- Peripheral Venous Cannulation
- Photometric Protein Determination
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- Plasmid Purification
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- Purifying Compounds by Recrystallization
- Quantifying Environmental Microorganisms and Viruses Using qPCR
- RNA-Seq
- Raman Spectroscopy for Chemical Analysis
- Recombineering and Gene Targeting
- Reconstitution of Membrane Proteins
- Regulating Temperature in the Lab: Applying Heat
- Regulating Temperature in the Lab: Preserving Samples Using Cold
- Removal of Branched and Cyclic Compounds by Urea Adduction for Uk'37 Paleothermometry
- Respiratory Exam II: Percussion and Auscultation
- Restriction Enzyme Digests
- Rodent Stereotaxic Surgery
- Rotary Evaporation to Remove Solvent
- SNP Genotyping
- Sample Preparation for Analytical Preparation
- Scanning Electron Microscopy (SEM)
- Schlenk Lines Transfer of Solvents
- Self-administration Studies
- Separating Protein with SDS-PAGE
- Separation of Mixtures via Precipitation

		<ul style="list-style-type: none"> • Soil Nutrient Analysis: Nitrogen, Phosphorus, and Potassium • Solid-Liquid Extraction • Solutions and Concentrations • Sonication Extraction of Lipid Biomarkers from Sediment • Soxhlet Extraction of Lipid Biomarkers from Sediment • Spatial Cueing • Spectrophotometric Determination of an Equilibrium Constant • Sterile Tissue Harvest • Surface Plasmon Resonance (SPR) • Surgical Cricothyrotomy • Tandem Mass Spectrometry • Testing For Genetically Modified Foods • The ATP Bioluminescence Assay • The Attentional Blink • The ELISA Method • The Ideal Gas Law • The Rubber Hand Illusion • The TUNEL Assay • The Transwell Migration Assay • The Western Blot • Tissue Regeneration with Somatic Stem Cells • Transplantation Studies • Turbidity and Total Solids in Surface Water • Two-Dimensional Gel Electrophoresis • Ultraviolet-Visible (UV-Vis) Spectroscopy • Understanding Concentration and Measuring Volumes • Using Differential Scanning Calorimetry to Measure Changes in Enthalpy • Using Diffusion Tensor Imaging in Traumatic Brain Injury • Using GIS to Investigate Urban Forestry • Using TMS to Measure Motor Excitability During Action Observation • Using a pH Meter • Visual Attention: fMRI Investigation of Object-based Attentional Control • X-ray Fluorescence (XRF) • Yeast Transformation and Cloning • fMRI: Functional Magnetic Resonance Imaging
GRADE LEVEL EXPECTATION	12.1.3.g.	<p>Explain how science advances with the introduction of new technology</p> <p><u>JoVE</u></p> <ul style="list-style-type: none"> • Abdominal Exam I: Inspection and Auscultation • Abdominal Exam IV: Acute Abdominal Pain Assessment • Algae Enumeration via Culturable Methodology • An Introduction to Aging and Regeneration

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- Bacterial Transformation: The Heat Shock Method
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- Central Venous Catheter Insertion: Subclavian Vein
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- Determining the Empirical Formula

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- Emergent Lateral Canthotomy and Inferior Catholysis
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- Finding Your Blind Spot and Perceptual Filling-in
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- Measuring Vital Signs
- Metabolic Labeling
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- Molecular Cloning
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- Nose, Sinuses, Oral Cavity and Pharynx Exam
- Nuclear Magnetic Resonance (NMR) Spectroscopy
- Nutrients in Aquatic Ecosystems
- Object Substitution Masking
- Ophthalmoscopic Examination
- PCR: The Polymerase Chain Reaction
- Passaging Cells
- Patch Clamp Electrophysiology
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- Physiological Correlates of Emotion Recognition
- Plasmid Purification
- Positive Reinforcement Studies
- Preparing Anhydrous Reagents and Equipment
- Protein Crystallization
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- Purification of a Total Lipid Extract with Column Chromatography
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- Regulating Temperature in the Lab: Applying Heat
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- Spatial Cueing
- Spectrophotometric Determination of an Equilibrium Constant
- Sterile Tissue Harvest
- Surface Plasmon Resonance (SPR)
- Surgical Cricothyrotomy
- Tandem Mass Spectrometry
- Testing For Genetically Modified Foods
- The ATP Bioluminescence Assay
- The Attentional Blink

		<ul style="list-style-type: none"> • The ELISA Method • The Ideal Gas Law • The Rubber Hand Illusion • The TUNEL Assay • The Transwell Migration Assay • The Western Blot • Tissue Regeneration with Somatic Stem Cells • Transplantation Studies • Turbidity and Total Solids in Surface Water • Two-Dimensional Gel Electrophoresis • Ultraviolet-Visible (UV-Vis) Spectroscopy • Understanding Concentration and Measuring Volumes • Using Differential Scanning Calorimetry to Measure Changes in Enthalpy • Using Diffusion Tensor Imaging in Traumatic Brain Injury • Using GIS to Investigate Urban Forestry • Using TMS to Measure Motor Excitability During Action Observation • Using a pH Meter • Visual Attention: fMRI Investigation of Object-based Attentional Control • X-ray Fluorescence (XRF) • Yeast Transformation and Cloning • fMRI: Functional Magnetic Resonance Imaging
<p>GRADE LEVEL EXPECTATION</p>	<p>12.1.3.h.</p>	<p>Recognize creativity, imagination, and a good knowledge base are all needed to advance the work of science and engineering</p> <p><u>JoVE</u></p> <ul style="list-style-type: none"> • Are You Smart or Hardworking? How Praise Influences Children's Motivation • Categories and Inductive Inferences • Children's Reliance on Artist Intentions When Identifying Pictures • Executive Function and the Dimensional Change Card Sort Task • How Children Solve Problems Using Causal Reasoning • Metacognitive Development: How Children Estimate Their Memory • Mutual Exclusivity: How Children Learn the Meanings of Words • Numerical Cognition: More or Less • Piaget's Conservation Task and the Influence of Task Demands • The Costs and Benefits of Natural Pedagogy • The Rouge Test: Searching for a Sense of Self
<p>CONTENT STANDARD</p>	<p>NE.SC 2:</p>	<p>PHYSICAL SCIENCE: Students will integrate and communicate the information, concepts, principles, processes, theories, and models of the Physical Sciences</p>

		to make connections with the natural and engineered world.
STRAND	2.1.	Matter
INDICATOR	12.2.1.	Students will investigate and describe matter in terms of its structure, composition and conservation.
STRAND		Properties and Structure of Matter
GRADE LEVEL EXPECTATION	12.2.1.a.	<p>Recognize bonding occurs when outer electrons are transferred (ionic) or shared (covalent)</p> <p><u>JoVE</u></p> <ul style="list-style-type: none"> • An Overview of Alkenone Biomarker Analysis for Paleothermometry • An Overview of bGDGT Biomarker Analysis for Paleoclimatology • Conversion of Fatty Acid Methyl Esters by Saponification for Uk'37 Paleothermometry • Determining the Solubility Rules of Ionic Compounds • Electrochemical Measurements of Supported Catalysts Using a Potentiostat/Galvanostat • Extraction of Biomarkers from Sediments - Accelerated Solvent Extraction • Purification of a Total Lipid Extract with Column Chromatography • Raman Spectroscopy for Chemical Analysis • Removal of Branched and Cyclic Compounds by Urea Adduction for Uk'37 Paleothermometry • Sonication Extraction of Lipid Biomarkers from Sediment • Soxhlet Extraction of Lipid Biomarkers from Sediment • Ultraviolet-Visible (UV-Vis) Spectroscopy
CONTENT STANDARD	NE.SC 2:	PHYSICAL SCIENCE: Students will integrate and communicate the information, concepts, principles, processes, theories, and models of the Physical Sciences to make connections with the natural and engineered world.
STRAND	2.1.	Matter
INDICATOR	12.2.1.	Students will investigate and describe matter in terms of its structure, composition and conservation.
STRAND		States of Matter
GRADE LEVEL EXPECTATION	12.2.1.b.	<p>Describe the energy transfer associated with phase changes between solids, liquids, and gasses</p> <p><u>JoVE</u></p> <ul style="list-style-type: none"> • Assembly of a Reflux System for Heated Chemical Reactions • Degassing Liquids with Freeze-Pump-Thaw Cycling • Fractional Distillation • Freezing-Point Depression to Determine an Unknown Compound

		<ul style="list-style-type: none"> • Growing Crystals for X-ray Diffraction Analysis • Preparing Anhydrous Reagents and Equipment • Purifying Compounds by Recrystallization • Rotary Evaporation to Remove Solvent • Schlenk Lines Transfer of Solvents • Separation of Mixtures via Precipitation • Solid-Liquid Extraction • Solutions and Concentrations • Using Differential Scanning Calorimetry to Measure Changes in Enthalpy
GRADE LEVEL EXPECTATION	12.2.1.c.	<p>Describe the three normal states of matter (solid, liquid, gas) in terms of energy, particle arrangement, particle motion, and strength of bond between molecules</p> <p><u>JoVE</u></p> <ul style="list-style-type: none"> • Degassing Liquids with Freeze-Pump-Thaw Cycling • Fractional Distillation • Gas Chromatography (GC) with Flame-Ionization Detection • Growing Crystals for X-ray Diffraction Analysis • Ideal Gas Law • Physical Properties Of Minerals I: Crystals and Cleavage • Physical Properties Of Minerals II: Polymineralic Analysis • Protein Crystallization • Purifying Compounds by Recrystallization • Schlenk Lines Transfer of Solvents • Separation of Mixtures via Precipitation • Solid-Liquid Extraction • The Ideal Gas Law
CONTENT STANDARD	NE.SC 2:	PHYSICAL SCIENCE: Students will integrate and communicate the information, concepts, principles, processes, theories, and models of the Physical Sciences to make connections with the natural and engineered world.
STRAND	2.1.	Matter
INDICATOR	12.2.1.	Students will investigate and describe matter in terms of its structure, composition and conservation.
STRAND		Physical and Chemical Changes
GRADE LEVEL EXPECTATION	12.2.1.d.	<p>Recognize a large number of chemical reactions involve the transfer of either electrons (oxidation/reduction) or hydrogen ions (acid/base) between reacting ions, molecules, or atoms</p> <p><u>JoVE</u></p> <ul style="list-style-type: none"> • Conducting Reactions Below Room Temperature • Cyclic Voltammetry (CV) • Determining the Solubility Rules of Ionic Compounds • Electrochemical Measurements of Supported Catalysts Using a Potentiostat/Galvanostat

		<ul style="list-style-type: none"> • Enzyme Assays and Kinetics • Growing Crystals for X-ray Diffraction Analysis • Introduction to Catalysis • Introduction to Titration • Le Châtelier's Principle • Nuclear Magnetic Resonance (NMR) Spectroscopy • Photometric Protein Determination • Preparing Anhydrous Reagents and Equipment • Proton Exchange Membrane Fuel Cells • Purifying Compounds by Recrystallization • Rotary Evaporation to Remove Solvent • Separation of Mixtures via Precipitation • The ELISA Method • Using Differential Scanning Calorimetry to Measure Changes in Enthalpy • Using a pH Meter
GRADE LEVEL EXPECTATION	12.2.1.e.	<p>Identify factors affecting rates of chemical reactions (temperature, particle size, surface area)</p> <p><u>JoVE</u></p> <ul style="list-style-type: none"> • Conducting Reactions Below Room Temperature • Coordination Chemistry Complexes • Determining Rate Laws and the Order of Reaction • Electrochemical Measurements of Supported Catalysts Using a Potentiostat/Galvanostat • Enzyme Assays and Kinetics • Introduction to Catalysis
CONTENT STANDARD	NE.SC 2:	PHYSICAL SCIENCE: Students will integrate and communicate the information, concepts, principles, processes, theories, and models of the Physical Sciences to make connections with the natural and engineered world.
STRAND	2.1.	Matter
INDICATOR	12.2.1.	Students will investigate and describe matter in terms of its structure, composition and conservation.
STRAND		Atomic Structure
GRADE LEVEL EXPECTATION	12.2.1.f.	<p>Recognize the charges and relative locations of subatomic particles (neutrons, protons, electrons)</p> <p><u>JoVE</u></p> <ul style="list-style-type: none"> • Coordination Chemistry Complexes • Nuclear Magnetic Resonance (NMR) Spectroscopy • Raman Spectroscopy for Chemical Analysis • Scanning Electron Microscopy (SEM) • X-ray Fluorescence (XRF)
GRADE LEVEL EXPECTATION	12.2.1.g.	<p>Describe properties of atoms, ions, and isotopes</p> <p><u>JoVE</u></p> <ul style="list-style-type: none"> • Capillary Electrophoresis (CE)

		<ul style="list-style-type: none"> • Chromatography-Based Biomolecule Purification Methods • Coordination Chemistry Complexes • Determining the Solubility Rules of Ionic Compounds • Electrochemical Measurements of Supported Catalysts Using a Potentiostat/Galvanostat • Electrophoretic Mobility Shift Assay (EMSA) • Introduction to Mass Spectrometry • Ion-Exchange Chromatography • MALDI-TOF Mass Spectrometry • Metabolic Labeling • Nuclear Magnetic Resonance (NMR) Spectroscopy • Raman Spectroscopy for Chemical Analysis • Tandem Mass Spectrometry • Two-Dimensional Gel Electrophoresis • X-ray Fluorescence (XRF)
CONTENT STANDARD	NE.SC 2:	PHYSICAL SCIENCE: Students will integrate and communicate the information, concepts, principles, processes, theories, and models of the Physical Sciences to make connections with the natural and engineered world.
STRAND	2.1.	Matter
INDICATOR	12.2.1.	Students will investigate and describe matter in terms of its structure, composition and conservation.
STRAND		Classification of Matter
GRADE LEVEL EXPECTATION	12.2.1.h.	<p>Describe the organization of the periodic table of elements with respect to patterns of physical and chemical properties</p> <p><u>JoVE</u></p> <ul style="list-style-type: none"> • Coordination Chemistry Complexes
CONTENT STANDARD	NE.SC 2:	PHYSICAL SCIENCE: Students will integrate and communicate the information, concepts, principles, processes, theories, and models of the Physical Sciences to make connections with the natural and engineered world.
STRAND	2.3.	Energy
INDICATOR	12.2.3.	Students will describe and investigate energy systems relating to the conservation and interaction of energy and matter.
STRAND		Sound/Mechanical Waves
GRADE LEVEL EXPECTATION	12.2.3.a.	<p>Describe mechanical wave properties (speed, wavelength, frequency, amplitude) and how waves travel through a medium</p> <p><u>JoVE</u></p> <ul style="list-style-type: none"> • Abdominal Exam II: Percussion • Auscultation • Ear Exam

		<ul style="list-style-type: none"> • Percussion • The Staircase Procedure for Finding a Perceptual Threshold
CONTENT STANDARD	NE.SC 2:	PHYSICAL SCIENCE: Students will integrate and communicate the information, concepts, principles, processes, theories, and models of the Physical Sciences to make connections with the natural and engineered world.
STRAND	2.3.	Energy
INDICATOR	12.2.3.	Students will describe and investigate energy systems relating to the conservation and interaction of energy and matter.
STRAND		Light
GRADE LEVEL EXPECTATION	12.2.3.c.	<p>Recognize that light can behave as a wave (diffraction and interference)</p> <p><u>JoVE</u></p> <ul style="list-style-type: none"> • Raman Spectroscopy for Chemical Analysis
CONTENT STANDARD	NE.SC 2:	PHYSICAL SCIENCE: Students will integrate and communicate the information, concepts, principles, processes, theories, and models of the Physical Sciences to make connections with the natural and engineered world.
STRAND	2.3.	Energy
INDICATOR	12.2.3.	Students will describe and investigate energy systems relating to the conservation and interaction of energy and matter.
STRAND		Heat
GRADE LEVEL EXPECTATION	12.2.3.d.	<p>Distinguish between temperature (a measure of the average kinetic energy of atomic or molecular motion) and heat (the quantity of thermal energy that transfers due to a change in temperature)</p> <p><u>JoVE</u></p> <ul style="list-style-type: none"> • Conducting Reactions Below Room Temperature • Freezing-Point Depression to Determine an Unknown Compound • Ideal Gas Law • Regulating Temperature in the Lab: Applying Heat • Regulating Temperature in the Lab: Preserving Samples Using Cold • The Ideal Gas Law • Using Differential Scanning Calorimetry to Measure Changes in Enthalpy
CONTENT STANDARD	NE.SC 2:	PHYSICAL SCIENCE: Students will integrate and communicate the information, concepts, principles, processes, theories, and models of the Physical Sciences to make connections with the natural and engineered world.

STRAND	2.3.	Energy
INDICATOR	12.2.3.	Students will describe and investigate energy systems relating to the conservation and interaction of energy and matter.
STRAND		Electricity/Magnetism
GRADE LEVEL EXPECTATION	12.2.3.f.	<p>Recognize that the production of electromagnetic waves is a result of changes in the motion of charges or by a changing magnetic field</p> <p><u>JoVE</u></p> <ul style="list-style-type: none"> • fMRI: Functional Magnetic Resonance Imaging
GRADE LEVEL EXPECTATION	12.2.3.g.	<p>Compare and contrast segments of the electromagnetic spectrum (radio, micro, infrared, visible, ultraviolet, x-rays, gamma) based on frequency and wavelength</p> <p><u>JoVE</u></p> <ul style="list-style-type: none"> • Ultraviolet-Visible (UV-Vis) Spectroscopy
CONTENT STANDARD	NE.SC 2:	PHYSICAL SCIENCE: Students will integrate and communicate the information, concepts, principles, processes, theories, and models of the Physical Sciences to make connections with the natural and engineered world.
STRAND	2.3.	Energy
INDICATOR	12.2.3.	Students will describe and investigate energy systems relating to the conservation and interaction of energy and matter.
STRAND		Nuclear
GRADE LEVEL EXPECTATION	12.2.3.h.	<p>Recognize that nuclear reactions (fission, fusion, radioactive decay) convert a fraction of the mass of interacting particles into energy, and this amount of energy is much greater than the energy in chemical interactions</p> <p><u>JoVE</u></p> <ul style="list-style-type: none"> • Determining Rate Laws and the Order of Reaction • Nuclear Magnetic Resonance (NMR) Spectroscopy
CONTENT STANDARD	NE.SC 2:	PHYSICAL SCIENCE: Students will integrate and communicate the information, concepts, principles, processes, theories, and models of the Physical Sciences to make connections with the natural and engineered world.
STRAND	2.3.	Energy
INDICATOR	12.2.3.	Students will describe and investigate energy systems relating to the conservation and interaction of energy and matter.
STRAND		Mechanical Energy
GRADE LEVEL EXPECTATION	12.2.3.j.	Identify that all energy can be considered to be either kinetic, potential, or energy contained by a field (e.g.

		electromagnetic waves) <u>JoVE</u> <ul style="list-style-type: none"> • Introduction to Mass Spectrometry • Nuclear Magnetic Resonance (NMR) Spectroscopy
CONTENT STANDARD	NE.SC 2:	PHYSICAL SCIENCE: Students will integrate and communicate the information, concepts, principles, processes, theories, and models of the Physical Sciences to make connections with the natural and engineered world.
STRAND	2.3.	Energy
INDICATOR	12.2.3.	Students will describe and investigate energy systems relating to the conservation and interaction of energy and matter.
STRAND		Chemical Energy
GRADE LEVEL EXPECTATION	12.2.3.k.	Identify endothermic and exothermic reactions <u>JoVE</u> <ul style="list-style-type: none"> • Conducting Reactions Below Room Temperature • Determining Rate Laws and the Order of Reaction • Le Châtelier's Principle • Using Differential Scanning Calorimetry to Measure Changes in Enthalpy
CONTENT STANDARD	NE.SC 3:	LIFE SCIENCE: Students will integrate and communicate the information, concepts, principles, processes, theories, and models of the Life Sciences to make connections with the natural and engineered world.
STRAND	3.1.	Structure and Function of Living Systems
INDICATOR	12.3.1.	Students will investigate and describe the chemical basis of the growth, development, and maintenance of cells.
STRAND		Characteristics of Life
GRADE LEVEL EXPECTATION	12.3.1.a.	Identify the complex molecules (carbohydrates, lipids, proteins, nucleic acids) that make up living organisms <u>JoVE</u> <ul style="list-style-type: none"> • An Introduction to Caenorhabditis elegans • An Introduction to Cell Death • An Introduction to Cell Division • An Introduction to Cell Metabolism • An Introduction to Cell Motility and Migration • An Introduction to Developmental Genetics • An Introduction to Molecular Developmental Biology • An Introduction to Saccharomyces cerevisiae • An Introduction to Transfection • An Overview of Alkenone Biomarker Analysis for Paleothermometry • An Overview of Epigenetics • An Overview of Gene Expression • An Overview of Genetic Analysis

- An Overview of Genetic Engineering
- An Overview of Genetics and Disease
- An Overview of bGDGT Biomarker Analysis for Paleoclimatology
- Annexin V and Propidium Iodide Labeling
- Bacterial Transformation: Electroporation
- Bacterial Transformation: The Heat Shock Method
- Biofuels: Producing Ethanol from Cellulosic Material
- C. elegans Maintenance
- Carbon and Nitrogen Analysis of Environmental Samples
- Cell Cycle Analysis
- Cell-surface Biotinylation Assay
- Chromatin Immunoprecipitation
- Chromatography-Based Biomolecule Purification Methods
- Co-Immunoprecipitation and Pull-Down Assays
- Column Chromatography
- Community DNA Extraction from Bacterial Colonies
- Conversion of Fatty Acid Methyl Esters by Saponification for Uk'37 Paleothermometry
- Cytogenetics
- DNA Gel Electrophoresis
- DNA Ligation Reactions
- DNA Methylation Analysis
- Density Gradient Ultracentrifugation
- Detecting Environmental Microorganisms with the Polymerase Chain Reaction and Gel Electrophoresis
- Detecting Reactive Oxygen Species
- Development and Reproduction of the Laboratory Mouse
- Development of the Chick
- Dialysis: Diffusion Based Separation
- Drosophila Larval IHC
- Drosophila melanogaster Embryo and Larva Harvesting and Preparation
- Electrophoretic Mobility Shift Assay (EMSA)
- Embryonic Stem Cell Culture and Differentiation
- Enzyme Assays and Kinetics
- Explant Culture for Developmental Studies
- Expression Profiling with Microarrays
- Extraction of Biomarkers from Sediments - Accelerated Solvent Extraction
- FM Dyes in Vesicle Recycling
- Förster Resonance Energy Transfer (FRET)
- Gel Purification
- Gene Silencing with Morpholinos
- Genetic Crosses
- Genetic Engineering of Model Organisms
- Genetic Screens
- Genome Editing
- In ovo Electroporation of Chicken Embryos

- Induced Pluripotency
- Introduction to Catalysis
- Introduction to Mass Spectrometry
- Invasion Assay Using 3D Matrices
- Invertebrate Lifespan Quantification
- Isolating Nucleic Acids from Yeast
- Live Cell Imaging of Mitosis
- MALDI-TOF Mass Spectrometry
- Metabolic Labeling
- Molecular Cloning
- Mouse Genotyping
- Nutrients in Aquatic Ecosystems
- PCR: The Polymerase Chain Reaction
- Photometric Protein Determination
- Plasmid Purification
- Protein Crystallization
- Purification of a Total Lipid Extract with Column Chromatography
- Quantifying Environmental Microorganisms and Viruses Using qPCR
- RNA Analysis of Environmental Samples Using RT-PCR
- RNA-Seq
- RNAi in *C. elegans*
- Recombineering and Gene Targeting
- Reconstitution of Membrane Proteins
- Removal of Branched and Cyclic Compounds by Urea Adduction for Uk'37 Paleothermometry
- Restriction Enzyme Digests
- SNP Genotyping
- Separating Protein with SDS-PAGE
- Soil Nutrient Analysis: Nitrogen, Phosphorus, and Potassium
- Sonication Extraction of Lipid Biomarkers from Sediment
- Soxhlet Extraction of Lipid Biomarkers from Sediment
- Spectrophotometric Determination of an Equilibrium Constant
- Tandem Mass Spectrometry
- Testing For Genetically Modified Foods
- The ATP Bioluminescence Assay
- The ELISA Method
- The TUNEL Assay
- The Transwell Migration Assay
- The Western Blot
- Two-Dimensional Gel Electrophoresis
- Ultraviolet-Visible (UV-Vis) Spectroscopy
- Whole-Mount In Situ Hybridization
- Yeast Maintenance
- Yeast Transformation and Cloning
- Zebrafish Breeding and Embryo Handling
- Zebrafish Microinjection Techniques
- Zebrafish Reproduction and Development

CONTENT STANDARD	NE.SC 3:	LIFE SCIENCE: Students will integrate and communicate the information, concepts, principles, processes, theories, and models of the Life Sciences to make connections with the natural and engineered world.
STRAND	3.1.	Structure and Function of Living Systems
INDICATOR	12.3.1.	Students will investigate and describe the chemical basis of the growth, development, and maintenance of cells.
STRAND		Cellular Composition of Organisms
GRADE LEVEL EXPECTATION	12.3.1.b.	<p>Identify the form and function of sub-cellular structures that regulate cellular activities</p> <p><u>JoVE</u></p> <ul style="list-style-type: none"> • An Introduction to Aging and Regeneration • An Introduction to Cell Death • An Introduction to Cell Division • An Introduction to Cell Metabolism • An Introduction to Transfection • Annexin V and Propidium Iodide Labeling • Cell Cycle Analysis • Density Gradient Ultracentrifugation • Detecting Reactive Oxygen Species • Enzyme Assays and Kinetics • Isolating Nucleic Acids from Yeast • Live Cell Imaging of Mitosis • Metabolic Labeling • The ATP Bioluminescence Assay • The TUNEL Assay
GRADE LEVEL EXPECTATION	12.3.1.c.	<p>Describe the cellular functions of photosynthesis, respiration, cell division, protein synthesis, transport of materials, and energy capture/release</p> <p><u>JoVE</u></p> <ul style="list-style-type: none"> • An Introduction to Cell Death • An Introduction to Cell Division • An Introduction to Cell Metabolism • An Introduction to Cell Motility and Migration • An Introduction to Developmental Neurobiology • An Introduction to Endocytosis and Exocytosis • An Introduction to Molecular Developmental Biology • An Introduction to Neurophysiology • An Introduction to Saccharomyces cerevisiae • An Introduction to Stem Cell Biology • An Introduction to Transfection • An Overview of Epigenetics • An Overview of Gene Expression • Annexin V and Propidium Iodide Labeling • Bacterial Growth Curve Analysis and its Environmental Applications • Biofuels: Producing Ethanol from Cellulosic Material • C. elegans Development and Reproduction

		<ul style="list-style-type: none"> • Calcium Imaging in Neurons • Cell Cycle Analysis • Cell-surface Biotinylation Assay • Chromatin Immunoprecipitation • DNA Methylation Analysis • Detecting Reactive Oxygen Species • Electrophoretic Mobility Shift Assay (EMSA) • Embryonic Stem Cell Culture and Differentiation • Explant Culture of Neural Tissue • Expression Profiling with Microarrays • FM Dyes in Vesicle Recycling • Gene Silencing with Morpholinos • Genetic Crosses • Genome Editing • In ovo Electroporation of Chicken Embryos • Induced Pluripotency • Invasion Assay Using 3D Matrices • Live Cell Imaging of Mitosis • Murine In Utero Electroporation • Neuronal Transfection Methods • Patch Clamp Electrophysiology • Primary Neuronal Cultures • RNA Analysis of Environmental Samples Using RT-PCR • RNA-Seq • Recombineering and Gene Targeting • Reconstitution of Membrane Proteins • The ATP Bioluminescence Assay • The TUNEL Assay • The Transwell Migration Assay • Using Diffusion Tensor Imaging in Traumatic Brain Injury • Whole-Mount In Situ Hybridization • Yeast Maintenance • Yeast Reproduction • Yeast Transformation and Cloning
CONTENT STANDARD	NE.SC 3:	LIFE SCIENCE: Students will integrate and communicate the information, concepts, principles, processes, theories, and models of the Life Sciences to make connections with the natural and engineered world.
STRAND	3.1.	Structure and Function of Living Systems
INDICATOR	12.3.1.	Students will investigate and describe the chemical basis of the growth, development, and maintenance of cells.
STRAND		Behavior
GRADE LEVEL EXPECTATION	12.3.1.d.	<p>Describe how an organism senses changes in its internal or external environment and responds to ensure survival</p> <p><u>JoVE</u></p> <ul style="list-style-type: none"> • Abdominal Exam I: Inspection and Auscultation • Abdominal Exam II: Percussion • Abdominal Exam III: Palpation

- **Abdominal Exam IV: Acute Abdominal Pain Assessment**
- **An Introduction to Cognition**
- **An Introduction to Learning and Memory**
- **An Introduction to Modeling Behavioral Disorders and Stress**
- **An Introduction to Motor Control**
- **An Introduction to Neurophysiology**
- **An Introduction to Reward and Addiction**
- **Anesthesia Induction and Maintenance**
- **Ankle Exam**
- **Anxiety Testing**
- **Arterial Line Placement**
- **Assessing Dexterity with Reaching Tasks**
- **Auscultation**
- **Balance and Coordination Testing**
- **Basic Care Procedures**
- **Basic Life Support Part II: Airway/Breathing and Continued Cardiopulmonary Resuscitation**
- **Basic Life Support: Cardiopulmonary Resuscitation and Defibrillation**
- **Basic Mouse Care and Maintenance**
- **Binocular Rivalry**
- **Blood Pressure Measurement**
- **Blood Withdrawal I**
- **Blood Withdrawal II**
- **Calcium Imaging in Neurons**
- **Cardiac Exam I: Inspection and Palpation**
- **Cardiac Exam II: Auscultation**
- **Cardiac Exam III: Abnormal Heart Sounds**
- **Central Venous Catheter Insertion: Femoral Vein with Ultrasound Guidance**
- **Central Venous Catheter Insertion: Internal Jugular with Ultrasound Guidance**
- **Central Venous Catheter Insertion: Subclavian Vein**
- **Color Afterimages**
- **Compound Administration I**
- **Compound Administration II**
- **Compound Administration III**
- **Compound Administration IV**
- **Comprehensive Breast Exam**
- **Considerations for Rodent Surgery**
- **Cranial Nerves Exam I (I-VI)**
- **Cranial Nerves Exam II (VII-XII)**
- **Crowding**
- **Decoding Auditory Imagery with Multivoxel Pattern Analysis**
- **Diagnostic Necropsy and Tissue Harvest**
- **Dichotic Listening**
- **Ear Exam**
- **Elbow Exam**
- **Emergency Tube Thoracostomy (Chest Tube**

Placement)

- Emergent Lateral Canthotomy and Inferior Catholysis
- Event-related Potentials and the Oddball Task
- Eye Exam
- Eye Tracking in Cognitive Experiments
- Fear Conditioning
- Finding Your Blind Spot and Perceptual Filling-in
- Foot Exam
- General Approach to the Physical Exam
- Hand and Wrist Exam
- Hip Exam
- Inattentive Blindness
- Intra-articular Shoulder Injection for Reduction

Following Anterior Shoulder Dislocation

- Intraosseous Needle Placement
- Just-noticeable Differences
- Knee Exam
- Lower Back Exam
- Lymph Node Exam
- Male Rectal Exam
- Measuring Grey Matter Differences with Voxel-based

Morphometry: The Musical Brain

- Measuring Reaction Time and Donders' Method of Subtraction

Subtraction

- Measuring Vital Signs
- Modeling Social Stress
- Motion-induced Blindness
- Motor Exam I
- Motor Exam II
- Motor Maps
- Neck Exam
- Needle Thoracostomy (needle Decompression) for Temporizing Tension Pneumothorax Treatment
- Nose, Sinuses, Oral Cavity and Pharynx Exam
- Object Substitution Masking
- Observation and Inspection
- Ophthalmoscopic Examination
- Palpation
- Pelvic Exam I: Assessment of the External Genitalia
- Pelvic Exam II: Speculum Exam
- Pelvic Exam III: Bimanual and Rectovaginal Exam
- Percussion
- Percutaneous Cricothyrotomy (Seldinger Technique)
- Pericardiocentesis
- Peripheral Vascular Exam
- Peripheral Vascular Exam Using a Continuous Wave

Doppler

- Peripheral Venous Cannulation
- Perspectives on Sensation and Perception
- Physiological Correlates of Emotion Recognition
- Pilot Testing
- Proper Adjustment of Patient Attire during the Physical

		<p>Exam</p> <ul style="list-style-type: none"> • Respiratory Exam I: Inspection and Palpation • Respiratory Exam II: Percussion and Auscultation • Self-administration Studies • Sensory Exam • Shoulder Exam I • Shoulder Exam II • Spatial Cueing • Spatial Memory Testing Using Mazes • Sterile Tissue Harvest • Surgical Cricothyrotomy • The Ames Room • The Attentional Blink • The Inverted-face Effect • The McGurk Effect • The Rubber Hand Illusion • The Split Brain • The Staircase Procedure for Finding a Perceptual Threshold • Thyroid Exam • Tree Identification: How To Use a Dichotomous Key • Using a pH Meter • Visual Attention: fMRI Investigation of Object-based Attentional Control • Visual Search for Features and Conjunctions • Visual Statistical Learning • Zebrafish Maintenance and Husbandry
CONTENT STANDARD	NE.SC 3:	LIFE SCIENCE: Students will integrate and communicate the information, concepts, principles, processes, theories, and models of the Life Sciences to make connections with the natural and engineered world.
STRAND	3.2.	Heredity
INDICATOR	12.3.2.	Students will describe the molecular basis of reproduction and heredity.
STRAND		Inherited Traits
GRADE LEVEL EXPECTATION	12.3.2.a.	<p>Identify that information passed from parents to offspring is coded in DNA molecules</p> <p><u>JoVE</u></p> <ul style="list-style-type: none"> • An Introduction to Caenorhabditis elegans • An Introduction to Cell Death • An Introduction to Cell Division • An Introduction to Cellular and Molecular Neuroscience • An Introduction to Developmental Genetics • An Introduction to Molecular Developmental Biology • An Introduction to Saccharomyces cerevisiae • An Introduction to Transfection • An Overview of Epigenetics • An Overview of Gene Expression • An Overview of Genetic Analysis

- An Overview of Genetic Engineering
- An Overview of Genetics and Disease
- Annexin V and Propidium Iodide Labeling
- Bacterial Transformation: Electroporation
- Bacterial Transformation: The Heat Shock Method
- Cell Cycle Analysis
- Chromatin Immunoprecipitation
- Community DNA Extraction from Bacterial Colonies
- Cytogenetics
- DNA Gel Electrophoresis
- DNA Ligation Reactions
- DNA Methylation Analysis
- Density Gradient Ultracentrifugation
- Detecting Environmental Microorganisms with the Polymerase Chain Reaction and Gel Electrophoresis
- Development and Reproduction of the Laboratory Mouse
- Drosophila melanogaster Embryo and Larva Harvesting and Preparation
- Electrophoretic Mobility Shift Assay (EMSA)
- Embryonic Stem Cell Culture and Differentiation
- Enzyme Assays and Kinetics
- Explant Culture for Developmental Studies
- Expression Profiling with Microarrays
- Förster Resonance Energy Transfer (FRET)
- Gel Purification
- Gene Silencing with Morpholinos
- Genetic Crosses
- Genetic Engineering of Model Organisms
- Genetic Screens
- Genome Editing
- In ovo Electroporation of Chicken Embryos
- Induced Pluripotency
- Isolating Nucleic Acids from Yeast
- Live Cell Imaging of Mitosis
- Molecular Cloning
- Mouse Genotyping
- PCR: The Polymerase Chain Reaction
- Photometric Protein Determination
- Plasmid Purification
- Protein Crystallization
- Quantifying Environmental Microorganisms and Viruses Using qPCR
- RNA Analysis of Environmental Samples Using RT-PCR
- RNA-Seq
- Recombineering and Gene Targeting
- Restriction Enzyme Digests
- SNP Genotyping
- Testing For Genetically Modified Foods
- The TUNEL Assay
- Two-Dimensional Gel Electrophoresis
- Whole-Mount In Situ Hybridization

		<ul style="list-style-type: none"> • Yeast Maintenance • Yeast Transformation and Cloning • Zebrafish Breeding and Embryo Handling
GRADE LEVEL EXPECTATION	12.3.2.b.	<p>Describe the basic structure of DNA and its function in genetic inheritance</p> <p><u>JoVE</u></p> <ul style="list-style-type: none"> • An Introduction to Caenorhabditis elegans • An Introduction to Cell Death • An Introduction to Cell Division • An Introduction to Cellular and Molecular Neuroscience • An Introduction to Developmental Genetics • An Introduction to Molecular Developmental Biology • An Introduction to Saccharomyces cerevisiae • An Introduction to Transfection • An Overview of Epigenetics • An Overview of Gene Expression • An Overview of Genetic Analysis • An Overview of Genetic Engineering • An Overview of Genetics and Disease • Annexin V and Propidium Iodide Labeling • Bacterial Transformation: Electroporation • Bacterial Transformation: The Heat Shock Method • Cell Cycle Analysis • Chromatin Immunoprecipitation • Community DNA Extraction from Bacterial Colonies • Cytogenetics • DNA Gel Electrophoresis • DNA Ligation Reactions • DNA Methylation Analysis • Density Gradient Ultracentrifugation • Detecting Environmental Microorganisms with the Polymerase Chain Reaction and Gel Electrophoresis • Development and Reproduction of the Laboratory Mouse • Drosophila melanogaster Embryo and Larva Harvesting and Preparation • Electrophoretic Mobility Shift Assay (EMSA) • Embryonic Stem Cell Culture and Differentiation • Enzyme Assays and Kinetics • Explant Culture for Developmental Studies • Expression Profiling with Microarrays • Förster Resonance Energy Transfer (FRET) • Gel Purification • Gene Silencing with Morpholinos • Genetic Crosses • Genetic Engineering of Model Organisms • Genetic Screens • Genome Editing • In ovo Electroporation of Chicken Embryos • Induced Pluripotency

		<ul style="list-style-type: none"> • Isolating Nucleic Acids from Yeast • Live Cell Imaging of Mitosis • Method of Standard Addition • Molecular Cloning • Mouse Genotyping • PCR: The Polymerase Chain Reaction • Photometric Protein Determination • Plasmid Purification • Protein Crystallization • Quantifying Environmental Microorganisms and Viruses Using qPCR • RNA Analysis of Environmental Samples Using RT-PCR • RNA-Seq • Recombineering and Gene Targeting • Restriction Enzyme Digests • SNP Genotyping • Testing For Genetically Modified Foods • The TUNEL Assay • Two-Dimensional Gel Electrophoresis • Whole-Mount In Situ Hybridization • Yeast Maintenance • Yeast Transformation and Cloning • Zebrafish Breeding and Embryo Handling
GRADE LEVEL EXPECTATION	12.3.2.c.	<p>Recognize how mutations could help, harm, or have no effect on individual organisms</p> <p><u>JoVE</u></p> <ul style="list-style-type: none"> • An Introduction to Aging and Regeneration • An Introduction to Caenorhabditis elegans • An Introduction to Cell Death • An Introduction to Cell Division • An Introduction to Developmental Genetics • An Introduction to Drosophila melanogaster • An Introduction to Modeling Behavioral Disorders and Stress • An Introduction to Saccharomyces cerevisiae • An Introduction to Transfection • An Introduction to the Zebrafish: Danio rerio • An Overview of Epigenetics • An Overview of Gene Expression • An Overview of Genetic Analysis • An Overview of Genetics and Disease • Genetic Engineering of Model Organisms • Genetic Screens • Isolating Nucleic Acids from Yeast • Passaging Cells • The TUNEL Assay
CONTENT STANDARD	NE.SC 3:	LIFE SCIENCE: Students will integrate and communicate the information, concepts, principles, processes, theories, and models of the Life Sciences to make connections with the natural and engineered world.

STRAND	3.2.	Heredity
INDICATOR	12.3.2.	Students will describe the molecular basis of reproduction and heredity.
STRAND		Reproduction
GRADE LEVEL EXPECTATION	12.3.2.d.	<p>Describe that sexual reproduction results in a largely predictable, variety of possible gene combinations in the offspring of any two parents</p> <p><u>JoVE</u></p> <ul style="list-style-type: none"> • An Introduction to <i>Caenorhabditis elegans</i> • An Introduction to <i>Saccharomyces cerevisiae</i> • An Introduction to the Chick: <i>Gallus gallus domesticus</i> • An Introduction to the Zebrafish: <i>Danio rerio</i> • <i>C. elegans</i> Development and Reproduction • Development and Reproduction of the Laboratory Mouse • Development of the Chick • <i>Drosophila</i> Development and Reproduction • <i>Drosophila melanogaster</i> Embryo and Larva Harvesting and Preparation • Fundamentals of Breeding and Weaning • Genetic Crosses • Genetic Screens • Yeast Maintenance • Yeast Reproduction • Zebrafish Breeding and Embryo Handling • Zebrafish Reproduction and Development
CONTENT STANDARD	NE.SC 3:	LIFE SCIENCE: Students will integrate and communicate the information, concepts, principles, processes, theories, and models of the Life Sciences to make connections with the natural and engineered world.
STRAND	3.3.	Flow of Matter and Energy in Ecosystems
INDICATOR	12.3.3.	Students will describe, on a molecular level, the cycling of matter and the flow of energy between organisms and their environment.
STRAND		Flow of Energy
GRADE LEVEL EXPECTATION	12.3.3.a.	<p>Explain how the stability of an ecosystem is increased by biological diversity</p> <p><u>JoVE</u></p> <ul style="list-style-type: none"> • Analysis of Earthworm Populations in Soil • Tree Identification: How To Use a Dichotomous Key • Tree Survey: Point-Centered Quarter Sampling Method
CONTENT STANDARD	NE.SC 3:	LIFE SCIENCE: Students will integrate and communicate the information, concepts, principles, processes, theories, and models of the Life Sciences to make connections with the natural and engineered world.
STRAND	3.3.	Flow of Matter and Energy in Ecosystems

INDICATOR	12.3.3.	Students will describe, on a molecular level, the cycling of matter and the flow of energy between organisms and their environment.
STRAND		Ecosystems
GRADE LEVEL EXPECTATION	12.3.3.b.	<p>Recognize that atoms and molecules cycle among living and nonliving components of the biosphere</p> <p><u>JoVE</u></p> <ul style="list-style-type: none"> • Algae Enumeration via Culturable Methodology • An Overview of Alkenone Biomarker Analysis for Paleothermometry • An Overview of bGDGT Biomarker Analysis for Paleoclimatology • Analysis of Earthworm Populations in Soil • Bacterial Growth Curve Analysis and its Environmental Applications • Carbon and Nitrogen Analysis of Environmental Samples • Conversion of Fatty Acid Methyl Esters by Saponification for Uk'37 Paleothermometry • Culturing and Enumerating Bacteria from Soil Samples • Determination Of Nox in Automobile Exhaust Using UV-VIS Spectroscopy • Dissolved Oxygen in Surface Water • Extraction of Biomarkers from Sediments - Accelerated Solvent Extraction • Filamentous Fungi • Fundamentals of Breeding and Weaning • Metabolic Labeling • Nutrients in Aquatic Ecosystems • Purification of a Total Lipid Extract with Column Chromatography • Removal of Branched and Cyclic Compounds by Urea Adduction for Uk'37 Paleothermometry • Soil Nutrient Analysis: Nitrogen, Phosphorus, and Potassium • Sonication Extraction of Lipid Biomarkers from Sediment • Soxhlet Extraction of Lipid Biomarkers from Sediment • Using GIS to Investigate Urban Forestry
CONTENT STANDARD	NE.SC 3:	LIFE SCIENCE: Students will integrate and communicate the information, concepts, principles, processes, theories, and models of the Life Sciences to make connections with the natural and engineered world.
STRAND	3.3.	Flow of Matter and Energy in Ecosystems
INDICATOR	12.3.3.	Students will describe, on a molecular level, the cycling of matter and the flow of energy between organisms and their environment.
STRAND		Impact on Ecosystems

<p>GRADE LEVEL EXPECTATION</p>	<p>12.3.3.d.</p>	<p>Analyze factors which may influence environmental quality</p> <p><u>JoVE</u></p> <ul style="list-style-type: none"> • Algae Enumeration via Culturable Methodology • Analysis of Earthworm Populations in Soil • Bacterial Growth Curve Analysis and its Environmental Applications • Biofuels: Producing Ethanol from Cellulosic Material • Carbon and Nitrogen Analysis of Environmental Samples • Community DNA Extraction from Bacterial Colonies • Culturing and Enumerating Bacteria from Soil Samples • Detecting Environmental Microorganisms with the Polymerase Chain Reaction and Gel Electrophoresis • Detection of Bacteriophages in Environmental Samples • Determination Of Nox in Automobile Exhaust Using UV-VIS Spectroscopy • Determination of Moisture Content in Soil • Determining the Solubility Rules of Ionic Compounds • Dissolved Oxygen in Surface Water • Enzyme Assays and Kinetics • Gas Chromatography (GC) with Flame-Ionization Detection • Gram Staining of Bacteria from Environmental Sources • Introduction to Mass Spectrometry • Isolation of Fecal Bacteria from Water Samples by Filtration • Le Châtelier's Principle • Lead Analysis of Soil Using Atomic Absorption Spectroscopy • Measuring Tropospheric Ozone • Nutrients in Aquatic Ecosystems • Quantifying Environmental Microorganisms and Viruses Using qPCR • RNA Analysis of Environmental Samples Using RT-PCR • Soil Nutrient Analysis: Nitrogen, Phosphorus, and Potassium • Tree Identification: How To Use a Dichotomous Key • Tree Survey: Point-Centered Quarter Sampling Method • Turbidity and Total Solids in Surface Water • Using Differential Scanning Calorimetry to Measure Changes in Enthalpy • Using GIS to Investigate Urban Forestry • Visualizing Soil Microorganisms via the Contact Slide Assay and Microscopy • Water Quality Analysis via Indicator Organisms • Zebrafish Maintenance and Husbandry
<p>CONTENT STANDARD</p>	<p>NE.SC 3:</p>	<p>LIFE SCIENCE: Students will integrate and communicate the information, concepts, principles, processes, theories,</p>

		and models of the Life Sciences to make connections with the natural and engineered world.
STRAND	3.4.	Biodiversity
INDICATOR	12.3.4.	Students will describe the theory of biological evolution.
STRAND		Biological Adaptations
GRADE LEVEL EXPECTATION	12.3.4.a.	<p>Identify different types of adaptations necessary for survival (morphological, physiological, behavioral)</p> <p><u>JoVE</u></p> <ul style="list-style-type: none"> • An Introduction to Caenorhabditis elegans • An Introduction to Cognition • An Introduction to Drosophila melanogaster • An Introduction to Learning and Memory • An Introduction to the Chick: Gallus gallus domesticus • An Introduction to the Laboratory Mouse: Mus musculus • An Introduction to the Zebrafish: Danio rerio • Basic Chick Care and Maintenance • Basic Mouse Care and Maintenance • C. elegans Chemotaxis Assay • Development of the Chick • Drosophila Development and Reproduction • Drosophila Maintenance • Fear Conditioning • Positive Reinforcement Studies • Spatial Memory Testing Using Mazes • Visualizing Soil Microorganisms via the Contact Slide Assay and Microscopy • Yeast Maintenance
CONTENT STANDARD	NE.SC 3:	LIFE SCIENCE: Students will integrate and communicate the information, concepts, principles, processes, theories, and models of the Life Sciences to make connections with the natural and engineered world.
STRAND	3.4.	Biodiversity
INDICATOR	12.3.4.	Students will describe the theory of biological evolution.
STRAND		Biological Evolution
GRADE LEVEL EXPECTATION	12.3.4.b.	<p>Recognize that the concept of biological evolution is a theory which explains the consequence of the interactions of: (1) the potential for a species to increase its numbers, (2) the genetic variability of offspring due to mutation and recombination of genes, (3) a finite supply of the resources required for life, and (4) the ensuing selection by the environment of those offspring better able to survive and leave offspring</p> <p><u>JoVE</u></p> <ul style="list-style-type: none"> • An Introduction to the Chick: Gallus gallus domesticus • An Overview of Genetic Analysis

GRADE LEVEL EXPECTATION	12.3.4.c.	<p>Explain how natural selection provides a scientific explanation of the fossil record and the molecular similarities among the diverse species of living organisms</p> <p><u>JoVE</u></p> <ul style="list-style-type: none"> • An Overview of Genetic Analysis
GRADE LEVEL EXPECTATION	12.3.4.d.	<p>Apply the theory of biological evolution to explain diversity of life over time</p> <p><u>JoVE</u></p> <ul style="list-style-type: none"> • An Introduction to the Chick: Gallus gallus domesticus • An Overview of Genetic Analysis
CONTENT STANDARD	NE.SC 4:	EARTH AND SPACE SCIENCES: Students will integrate and communicate the information, concepts, principles, processes, theories, and models of Earth and Space Sciences to make connections with the natural and engineered world.
STRAND	4.2.	Earth Structures and Processes
INDICATOR	12.4.2.	Students will investigate the relationships among Earth's structure, systems, and processes.
STRAND		Properties of Earth Materials
GRADE LEVEL EXPECTATION	12.4.2.a.	<p>Recognize how Earth materials move through geochemical cycles (carbon, nitrogen, oxygen) resulting in chemical and physical changes in matter</p> <p><u>JoVE</u></p> <ul style="list-style-type: none"> • An Overview of Alkenone Biomarker Analysis for Paleothermometry • An Overview of bGDGT Biomarker Analysis for Paleoclimatology • Conversion of Fatty Acid Methyl Esters by Saponification for Uk'37 Paleothermometry • Determination Of Nox in Automobile Exhaust Using UV-VIS Spectroscopy • Extraction of Biomarkers from Sediments - Accelerated Solvent Extraction • Purification of a Total Lipid Extract with Column Chromatography • Removal of Branched and Cyclic Compounds by Urea Adduction for Uk'37 Paleothermometry • Sonication Extraction of Lipid Biomarkers from Sediment • Soxhlet Extraction of Lipid Biomarkers from Sediment • Using GIS to Investigate Urban Forestry
CONTENT STANDARD	NE.SC 4:	EARTH AND SPACE SCIENCES: Students will integrate and communicate the information, concepts, principles, processes, theories, and models of Earth and Space

		Sciences to make connections with the natural and engineered world.
STRAND	4.2.	Earth Structures and Processes
INDICATOR	12.4.2.	Students will investigate the relationships among Earth's structure, systems, and processes.
STRAND		Earth's Processes
GRADE LEVEL EXPECTATION	12.4.2.b.	Describe how heat convection in the mantle propels the plates comprising Earth's surface across the face of the globe (plate tectonics) <u>JoVE</u> <ul style="list-style-type: none"> • Determining Spatial Orientation of Rock Layers with the Brunton Compass • Igneous Intrusive Rock • Igneous Volcanic Rock • Making a Geologic Cross Section • Using Topographic Maps to Generate Topographic Profiles
CONTENT STANDARD	NE.SC 4:	EARTH AND SPACE SCIENCES: Students will integrate and communicate the information, concepts, principles, processes, theories, and models of Earth and Space Sciences to make connections with the natural and engineered world.
STRAND	4.2.	Earth Structures and Processes
INDICATOR	12.4.2.	Students will investigate the relationships among Earth's structure, systems, and processes.
STRAND		Use of Earth Materials
GRADE LEVEL EXPECTATION	12.4.2.c.	Evaluate the impact of human activity and natural causes on Earth's resources (groundwater, rivers, land, fossil fuels) <u>JoVE</u> <ul style="list-style-type: none"> • Biofuels: Producing Ethanol from Cellulosic Material • Determination Of Nox in Automobile Exhaust Using UV-VIS Spectroscopy • Dissolved Oxygen in Surface Water • Introduction to Mass Spectrometry • Lead Analysis of Soil Using Atomic Absorption Spectroscopy • Making a Geologic Cross Section • Measuring Tropospheric Ozone • Nutrients in Aquatic Ecosystems • Proton Exchange Membrane Fuel Cells • Tree Identification: How To Use a Dichotomous Key • Tree Survey: Point-Centered Quarter Sampling Method • Turbidity and Total Solids in Surface Water • Using GIS to Investigate Urban Forestry • Water Quality Analysis via Indicator Organisms

CONTENT STANDARD	NE.SC 4:	EARTH AND SPACE SCIENCES: Students will integrate and communicate the information, concepts, principles, processes, theories, and models of Earth and Space Sciences to make connections with the natural and engineered world.
STRAND	4.3.	Energy in Earth's Systems
INDICATOR	12.4.3.	Students will investigate and describe the relationships among the sources of energy and their effects on Earth's systems.
STRAND		Energy Sources
GRADE LEVEL EXPECTATION	12.4.3.a.	Identify internal and external sources of heat energy in Earth's systems <u>JoVE</u> • Turbidity and Total Solids in Surface Water
GRADE LEVEL EXPECTATION	12.4.3.c.	Compare and contrast benefits of renewable and nonrenewable energy sources <u>JoVE</u> • Biofuels: Producing Ethanol from Cellulosic Material • Proton Exchange Membrane Fuel Cells
CONTENT STANDARD	NE.SC 4:	EARTH AND SPACE SCIENCES: Students will integrate and communicate the information, concepts, principles, processes, theories, and models of Earth and Space Sciences to make connections with the natural and engineered world.
STRAND	4.4.	Earth's History
INDICATOR	12.4.4.	Students will explain the history and evolution of Earth.
STRAND		Past/Present Earth
GRADE LEVEL EXPECTATION	12.4.4.a.	Recognize that in any sequence of sediments or rocks that has not been overturned, the youngest sediments or rocks are at the top of the sequence and the oldest are at the bottom (law of superposition) <u>JoVE</u> • Making a Geologic Cross Section
GRADE LEVEL EXPECTATION	12.4.4.b.	Interpret Earth's history by observing rock sequences, using fossils to correlate the sequences at various locations, and using data from radioactive dating methods <u>JoVE</u> • Making a Geologic Cross Section
GRADE LEVEL EXPECTATION	12.4.4.c.	Compare and contrast the physical and biological differences of the early Earth with the planet we live on today <u>JoVE</u>

		<ul style="list-style-type: none">• An Overview of Alkenone Biomarker Analysis for Paleothermometry• An Overview of bGDGT Biomarker Analysis for Paleoclimatology• Conversion of Fatty Acid Methyl Esters by Saponification for Uk'37 Paleothermometry• Igneous Intrusive Rock• Making a Geologic Cross Section• Purification of a Total Lipid Extract with Column Chromatography• Removal of Branched and Cyclic Compounds by Urea Adduction for Uk'37 Paleothermometry
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