

Grade 8



CTN partnered with Discovery Education to create this resource of educational materials aligned with Next Generation Standards. This curriculum alignment provides resources for educators to use in lesson plans, guided groups, and classroom activities.

Curriculum Resources Science



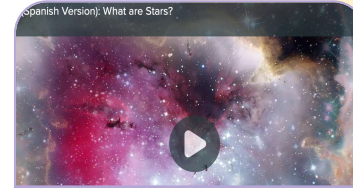
Unit 1

ENERGY, FORCES, AND MOTION



Unit 2

EARTH'S PLACE IN THE UNIVERSE



Unit 3

GROWTH, DEVELOPMENT, AND REPRODUCTION OF ORGANISMS



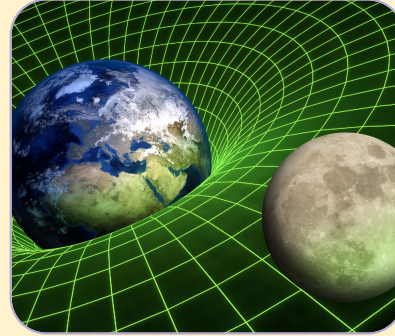
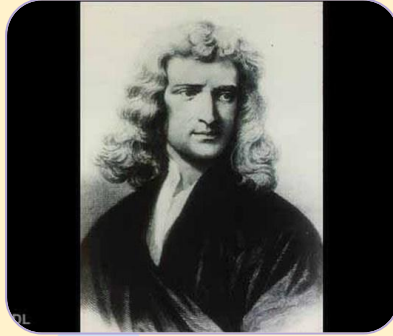
Unit 4

EVOLUTION, NATURAL SELECTION, AND ADAPTATIONS



Unit 5

EVOLUTION OF TECHNOLOGY IN SCIENCE


Standard: MS-PS2-1

Apply Newton's Third Law to design a solution to a problem involving the motion of two colliding objects.


Video

- [Newton's Third Law \(Enrichment\)](#)
- [Newton's Third Law of Motion](#)
- [Newton's Third Law of Motion \(Spanish Version\)](#)
- [Newton's Third Law of Motion: Actions and Reactions](#)
- [Real-World Phenomena: Car Collision](#)
- [Real-World Phenomena: Car Collision \(Spanish Version\)](#)
- [Superstars of Science: Sir Isaac Newton](#)
- [Jahna Rinaldi: Collision Reconstructionist](#)
- [STEMonstrations: Newton's Third Law of Motion](#)


Activity

- [The Impact of Collision](#)
- [The Dynamics of a Car Crash](#)

Standard: MS-PS2-1

Apply Newton's Third Law to design a solution to a problem involving the motion of two colliding objects.

**Exploration**

- [Collision Lab](#)

**Ready to Use**

- [Newton's Third Law of Motion](#)

Standard: MS-PS2-2

Plan and conduct an investigation to provide evidence that the change in an object's motion depends on the sum of the forces on the object and the mass of the object.

**Video**

- [Real World Science: Forces](#)
- [Effects of Force](#)
- [Force and Motion](#)
- [Unbalanced Forces](#)
- [Unbalanced Forces \(Spanish Version\)](#)
- [Newton's First Law of Motion](#)
- [Newton's First Law of Motion \(Spanish Version\)](#)
- [STEMonstrations: Newton's Second Law of Motion](#)
- [Newton's Second Law of Motion: Acceleration of an Object \(Enrichment\)](#)

Standard: MS-PS2-2

Plan and conduct an investigation to provide evidence that the change in an object's motion depends on the sum of the forces on the object and the mass of the object.

**Ready to Use**

- [Newton's First Law of Motion](#)
- [Newton's Second Law of Motion](#)

**Exploration**

- [Gravity Force Lab: Basics](#)
- [Projectile Motion](#)

**Song**

- [Lodge McCammon Songs: Newton's First Law with Velocity, Acceleration, and Momentum](#)

Standard: MS-PS2-4

Construct and present arguments using evidence to support the claim that gravitational interactions are attractive and depend on the masses of interacting objects and the distance between them.

**Video**

- [Gravity and Planetary Motion](#)
- [Gravity and Planetary Motion \(Spanish Version\)](#)
- [Law of Universal Gravitation](#)
- [Gravitational Force in the Solar System](#)
- [Factors Affecting Gravitational Force](#)
- [What is Gravity](#)
- [What is Gravity \(Spanish Version\)](#)
- [Invisible Forces](#)
- [Street Science: Dead Drop Danger](#)
- [Introduction to the Force of Gravity and Gravitational Mass \(Enrichment\)](#)

Standard: MS-PS2-4

Construct and present arguments using evidence to support the claim that gravitational interactions are attractive and depend on the masses of interacting objects and the distance between them.

**Exploration**

- [Gravity and Orbits](#)
- [Gravity Force Lab: Basics](#)
- [The Attraction is Mutual](#)
- [The Attraction is Mutual \(Spanish Version\)](#)

**Reading Passage**

- [What is Gravity \(Intervention\)](#)

**Ready to Use**

- [Gravity](#)

Standard: MS-PS3-1

Construct and interpret graphical displays of data to describe the relationships of kinetic energy to the mass of an object and to the speed of an object.

**Video**

- [STEMonstrations: Kinetic and Potential Energy](#)
- [DEMystified: Kinetic Energy](#)
- [DEMystified: Kinetic Energy \(Spanish Version\)](#)
- [Kinetic Energy](#)
- [Flying Objects in the Car](#)
- [Effects of Force and Speed](#)

Standard: MS-PS3-1

Construct and interpret graphical displays of data to describe the relationships of kinetic energy to the mass of an object and to the speed of an object.

**Video**

- [What is Kinetic Energy?](#)
- [What is Kinetic Energy \(Spanish Version\)](#)
- [Science Kids: All About Energy](#)
- [Different Types of Kinetic Energy](#)

**Exploration**

- [Types of Energy \(Enrichment\)](#)
- [Energy Skate Park](#)

**Ready to Use**

- [Background Builder: Kinetic Energy \(6-8\)](#)

Standard: MS-PS3-2

Develop a model to describe that when the arrangement of objects interacting at a distance changes, different amounts of potential energy are stored in the system.

**Video**

- [Human-Powered Rides](#)
- [Backyard Roller Coaster](#)
- [What is Potential Energy](#)
- [Potential Energy](#)
- [Potential Energy \(Spanish Version\)](#)
- [Potential Energy \(Intervention\)](#)

Standard: MS-PS3-2

Develop a model to describe that when the arrangement of objects interacting at a distance changes, different amounts of potential energy are stored in the system.

**Ready to Use**

- [Background Builder: Potential Energy \(6-8\)](#)

**Exploration**

- [Energy Skate Park](#)

Standard: MS-PS3-5

Construct, use, and present an argument to support the claim that when work is done on or by a system, the energy of the system changes as energy is transferred to or from the system.

**Video**

- [Energy Transfer](#)
- [Work and Energy Transfers](#)
- [Galilean Cannon](#)
- [Motorcycle Swing](#)

**Activity**

- [Energy Transformation \(Enrichment\)](#)
- [Game Set Match](#)
- [Girls Get STEM: How to Make a Chain Reaction \(Intervention\)](#)
- [Rocket Car Grand Prix Family Activity](#)
- [You Be the Chemist: Balloon Rockets Student Worksheet](#)
- [Tackling Potential and Kinetic Energy \(Intervention\)](#)

Standard: MS-PS3-5

Construct, use, and present an argument to support the claim that when work is done on or by a system, the energy of the system changes as energy is transferred to or from the system.

**Exploration**

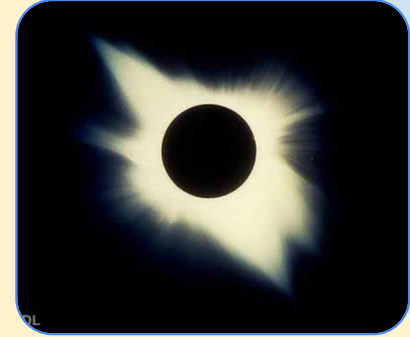
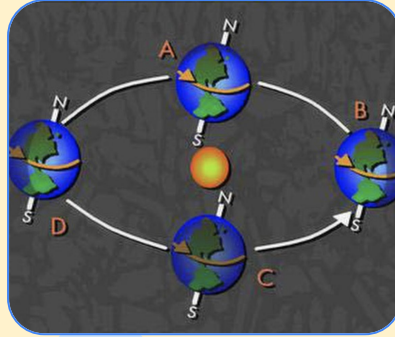
- [Conservation of Energy](#) (Enrichment)

**Slide Show**

- [STEM Camp: Energy](#)

**Ready to Use**

- [Tackling Kinetic Energy: Connect the Dots](#)
- [Energy Transfer: Whittle It Down](#)

**Standard: MS-PS2-4**

Construct and present arguments using evidence to support the claim that gravitational interactions are attractive and depend on the masses of interacting objects and the distance between them.

**Video**

- [Universal Gravitation](#)
- [Law of Universal Gravitation](#)
- [Gravity and Planetary Motion](#)
- [Gravity and Planetary Motion \(Spanish Version\)](#)
- [Gravitational Force in the Solar System](#)
- [Factors Affecting Gravitational Force](#)
- [What is Gravity](#)
- [What is Gravity \(Spanish Version\)](#)
- [Invisible Forces](#)
- [Gravity and Inertia](#)

Standard: MS-PS2-4

Construct and present arguments using evidence to support the claim that gravitational interactions are attractive and depend on the masses of interacting objects and the distance between them.

**Ready to Use**

- [Background Builder: Gravity \(6-8\)](#)

**Activity**

- [Power of Gravity](#)

**Reading Passage**

- [How Do Mass and Weight Differ](#)

**Exploration**

- [The Attraction is Mutual](#)
- [Gravity Force Lab: Basics](#)
- [Gravity and Orbits](#)

Standard: MS-ESS1-1

Develop and use a model of the Earth-Sun-moon system to describe the cyclic patterns of lunar phases, eclipses of the Sun and moon, and seasons.

**Video**

- [The Four Seasons](#)
- [The Seasons](#)
- [Movements Around the Sun](#)

Standard: MS-ESS1-1

Develop and use a model of the Earth-Sun-moon system to describe the cyclic patterns of lunar phases, eclipses of the Sun and moon, and seasons.

**Video**

- [Movements Around the Sun \(Spanish Version\)](#)
- [The Revolving Earth](#)
- [Movement of the Earth](#)
- [What are the Phases of the Moon](#)
- [Demystified: Phases of the Moon](#)
- [Demystified: Phases of the Moon \(Spanish Version\)](#)
- [Science Kids: All About the Moon](#)

**Ready to Use**

- [Background Builder: Eclipses \(6-8\)](#)
- [Background Builder: Seasons \(6-8\)](#)
- [Background Builder: Lunar Phases \(6-8\)](#)

**Reading Passage**

- [Changing Seasons](#)
- [What Causes the Earth to Experience Different Seasons?](#)
- [Eclipse](#)

**Model Lesson**

- [Let's Launch!: Lunar Brochure Lesson](#)
- [Let's Launch!: Eclipses Lesson](#)

**Exploration**

- [To Every Season](#)
- [Seasons \(Intervention\)](#)

Standard: MS-ESS1-2

Develop and use a model to describe the role of gravity in the motions within galaxies and the solar system.

**Video**

- Gravity: Gravity and Orbits
- Gravity: Gravity and Orbits (Spanish Version)
- The Revolving Planets
- The Revolving Planets (Spanish Version)
- Space Exploration: What is an Orbit
- Orbit (Spanish Version)
- Examining Gravity and its Pull
- The Power of Gravity
- Orbits and Gravity

**Ready to Use**

- Background Builder: Solar System (6-8)
- Background Builder: Galaxies (6-8)
- Planets of the Solar System: Student Activity (6-12)

**Reading Passage**

- What is Gravity

**Activity**

- Power of Gravity

**Audio**

- The Solar System: Planets, Gravity, & Orbits (Intervention)

**Exploration**

- Gravity and Orbits

Standard: MS-ESS1-3

Analyze and interpret data to determine scale properties of objects in the solar system.

**Video**

- [Real World: Scaling the Solar System](#)
- [Scale Model of the Orbit of Planet Nine](#)
- [A Scale Model of the Solar System](#)
- [Scale Models of our Solar System](#)
- [Building a Scale Model of the Solar System](#)
- [Using Models to Illustrate the Scale of Space](#)
- [Scale](#)

**Ready to Use**

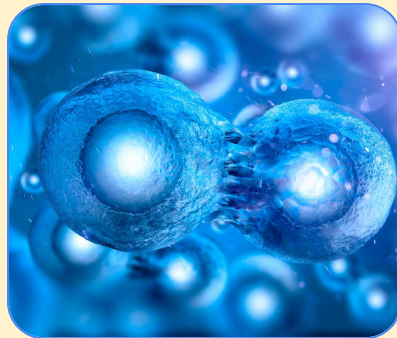
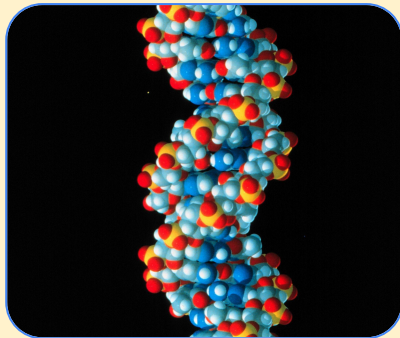
- [Planets of the Solar System: Student Activity \(6-12\)](#)

**Model Lesson**

- [Let's Launch!: Planet Size](#)

**Channel**

- [Scale](#)



Standard: MS-LS1-4

Use argument based on empirical evidence and scientific reasoning to support an explanation for how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals.



Video

- What Are Adaptations
- Leaf Adaptations
- Ways Animals Adapt to Environments
- Science Kids: All about Natural Selection and Adaptations
- Adaptations for Self and Cross-Pollination
- Bird Boogie
- Evolutionary Advantages of Walking Upright
- The Wild Takhis' Life: The Dominant Male and His Herd



Board

- Claim, Evidence, Reasoning: Activity Template

Standard: MS-LS1-5

Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms.

**Video**

- [Somalia and Kenya: Drought, Famine, and Starvation](#)
- [Warming Temperatures Impact Middle America](#)
- [Fertilizers and Manures](#)
- [Photoperiod: The Sun's Energy and the Growth of Plants and Animals](#)
- [Farming the Desert](#)
- [How Does Light Affect Plant Growth](#)
- [Physical and Abiotic Factors Impact Living Systems](#)
- [The Science of Plants: Grades 06-08: Environmental Enclaves](#)

**Board**

- [Claim, Evidence, Reasoning: Activity Template](#)

Standard: MS-LS3-1

Develop and use a model to explain structural changes to genes (mutations) located on chromosomes may affect proteins and may result in harmful, beneficial, or neutral effects to the structure and function of the organism.

**Video**

- DNA Mutations
- DNA Mutations (Spanish Version)
- Mutations
- Mutation: Negative and Positive Impacts
- DNA, Genetic Mutations, and Evolution
- The Role of Mutations
- Science in Progress: Cancer Cells (Enrichment)

**Activity**

- Secrets of Sequencing (Enrichment)

**Audio**

- Heredity: The Effect of Gene Distance on Chromosome Crossover

**Ready to Use**

- Genes

**Presentation**

- Decoding DNA Grab & Go
- DNA Coded: Targeting Cancer

Standard: MS-LS3-2

Develop and use a model to describe how asexual reproduction results in offspring with identical genetic information and sexual reproduction results in offspring with genetic variation.

**Video**

- [Reproduction](#)
- [Mitosis](#)
- [Making New Cells](#)
- [Mitosis, Meiosis, and Binary Fission](#)
- [Chromosomes, DNA, and Genes](#)
- [Genetics and Meiosis](#)
- [Meiosis and Gametes](#)
- [Phases of Meiosis: Part One](#)
- [Phases of Meiosis: Part Two](#)
- [Investigating Heredity](#)
- [Science Kids: All about Genetics: Dominant and Recessive Genes](#)

**Song**

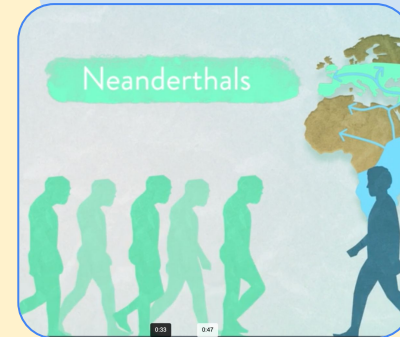
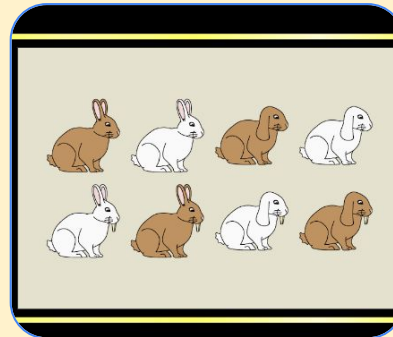
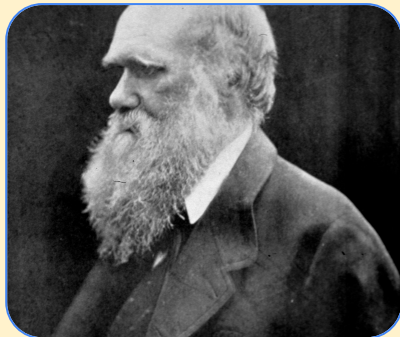
- [Mitosis](#)

**Channel**

- [Mitosis](#)

**Ready to Use**

- [Reproduction](#)

**Standard: MS-LS4-1**

Analyze and interpret data for patterns in the fossil record that document the existence, diversity, extinction, and changes of life forms throughout the history of life on Earth under the assumption that natural laws operate today as in the past.

**Video**

- [Evolution and Fossils](#)
- [Evidence of Evolution](#)
- [What is the Fossil Record](#)
- [Science in Progress: The Fossil Record](#)
- [Earth Science: Fossils](#)
- [Fossil Hunting on the Galapagos Islands](#)
- [Fossils](#)
- [DEmystified: Why Fossils Matter](#)

Standard: MS-LS4-1

Analyze and interpret data for patterns in the fossil record that document the existence, diversity, extinction, and changes of life forms throughout the history of life on Earth under the assumption that natural laws operate today as in the past.

**Video**

- Evolution and Fossils
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- Fossil Hunting on the Galapagos Islands
- Fossils
- DEmystified: Why Fossils Matter

**Channel**

- Fossils

**Ready to Use**

- Background Builder: Fossils (6-8)
- Fossil Record: Connect the Dots

**Reading Passage**

- These May Be the Oldest Fossils on Earth

Standard: MS-LS4-2

Apply scientific ideas to construct an explanation for the anatomical similarities and differences among modern organisms and between model and fossil organisms to infer evolutionary relationships.

**Video**

- [Evolution and Homologous Organs](#)
- [Evolution and Homologous Organs \(Spanish Version\)](#)
- [Homology](#)
- [Biology in Focus: How Do Organisms Evolve?](#)
- [How Do Developmental Homologies Relate to the Evolutionary History of an Organism?](#)
- [Biomes: Islands and Evolution](#)
- [Walking with Lucy](#)
- [Walking on Two Feet](#)
- [Origin and Diversity of Mammals \(Enrichment\)](#)
- [Hominid Evolution \(Enrichment\)](#)
- [Evolution of the Human Hand \(Enrichment\)](#)

**Reading Passage**

- [Let's Learn about Early Humans](#)

**Ready to Use**

- [Background Builder: Evolution \(6-8\)](#)

Standard: MS-LS4-3

Analyze displays of pictorial data to compare patterns of similarities in the embryological development across multiple species to identify relationships not evident in the fully formed anatomy.



Video

- [Evolution and Embryos of Chordates](#)
- [Evolution and Embryos of Chordates \(Spanish Version\)](#)
- [What is Developmental Homology](#)
- [What is Developmental Homology \(Spanish Version\)](#)
- [Developmental Homologies](#)
- [Evidence for Evolution](#)

Standard: MS-LS4

MS-LS4-4

Construct an explanation based on evidence that describes how genetic variations of traits in a population increase some individuals' probability of surviving and reproducing in a specific environment.

MS-LS4-6

Use mathematical representations to support explanations of how natural selection may lead to increases and decreases of specific traits in populations over time.



Video

- [Who was Charles Darwin?](#)
- [Darwin's Natural Selection](#)
- [Natural Selection](#)
- [Natural Selection: Examples from the Galapagos](#)

Standard: MS-LS4

MS-LS4-4

Construct an explanation based on evidence that describes how genetic variations of traits in a population increase some individuals' probability of surviving and reproducing in a specific environment.

MS-LS4-6

Use mathematical representations to support explanations of how natural selection may lead to increases and decreases of specific traits in populations over time.



Video

- [Islands of Theory: Charles Darwin and Why Evolution Occurs](#)
- [The Jeff Corwin Experience: The Galapagos Islands: Land of Evolutionary Change](#)
- [Natural Selection](#)
- [Evolution Islands](#)
- [Darwin, the Beagle, and Finches: Darwin Discovers Evidence of Natural Selection](#)
- [Evidence of Evolution](#)
- [The Evolution of Complex Organs](#)



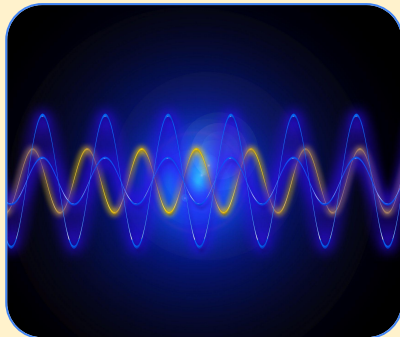
Exploration

- [Natural Selection](#)



Ready to Use

- [Background Builder: Natural Selection \(6-8\)](#)
- [Background Builder: Adaptation \(6-8\)](#)

**Standard: MS-PS4-1**

Develop a model and use mathematical representations to describe waves that includes frequency, wavelength, and how the amplitude of a wave is related to the energy in a wave.

**Video**

- [Sound Waves](#)
- [Sound Waves](#)
- [Waves: Energy in Motion](#)
- [Measuring Sound](#)
- [Measuring Sound \(Spanish Version\)](#)
- [Wave Characteristics](#)
- [Properties of Waves](#)
- [Properties of Waves \(Spanish Version\)](#)
- [Physics in Focus: Wave Characteristics: Part 01 \(Enrichment\)](#)
- [Science Kids: Sound](#)

Standard: MS-PS4-1

Develop a model and use mathematical representations to describe waves that includes frequency, wavelength, and how the amplitude of a wave is related to the energy in a wave.

**Song**

- [Lodge McCammon Songs: Back Up](#)

**Exploration**

- [Waves Intro](#)
- [Describing Waves](#)
- [Wave on a String](#)
- [Wave Characteristics \(Enrichment\)](#)

Standard: MS-PS4-2

Develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials.

**Video**

- [Reflection and Refraction](#)
- [Reflection and Refraction \(Spanish Version\)](#)
- [N*GEN: Sound](#)
- [Light Waves and Sound Waves](#)
- [What are the Characteristics of Sound Waves](#)

Standard: MS-PS4-2

Develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials.

**Video**

- [What are the Characteristics of Sound Waves](#)
- [Properties of Electromagnetic Waves](#)
- [Refraction: Bending Light Waves](#)
- [Waves from the Sun](#)
- [N*GEN Light](#)
- [What is Light](#)

**Reading Passage**

- [Light and Other Forms of Energy on the Move](#)

**Exploration**

- [The Speed of Sound](#)
- [The Electromagnetic Spectrum: Visual Database](#)

**Ready to Use**

- [Background Builder: Wave Patterns \(6-8\)](#)

Standard: MS-PS4-3

Integrate qualitative scientific and technical information to support the claim that digitized signals are a more reliable way to encode and transmit information than analog signals.

**Video**

- [TGR Edu: Explore: Explore Digital Transmission](#)
- [Telecommunications and Fiber Optics](#)
- [Computer Forensics Specialist](#)
- [Transmitting Television Signals](#)
- [Extraterrestrial Code \(Enrichment\)](#)

**Collaborative Project**

- [TGR EDU Explore: Digital Transmission](#)

**Activity**

- [Young Scientist Lab: Gelatin Optic Fibers](#)
- [Satellite Telemetry \(Enrichment\)](#)

Standard: MS-LS4-5

Gather and synthesize information about the technologies that have changed the way humans influence the inheritance of desired traits in organisms.

**Video**

- [Selection](#)
- [Fish Hatcheries](#)
- [Genetically Engineering Genius](#)

Standard: MS-LS4-5

Gather and synthesize information about the technologies that have changed the way humans influence the inheritance of desired traits in organisms.

**Video**

- [Genetic Engineering, the Human Genome Project, and Gene Therapy](#)
- [Giant Chicken](#)
- [The Origins of Modern Crops](#)
- [Engineering and Growing Corn](#)

**Exploration**

- [Natural Selection](#)

**Ready to Use**

- [Background Builder: Artificial Selection \(6-8\)](#)



Video



Activity



Exploration



Interactive



**Reading
Passage**



**Ready
to Use**



**Slide
Show**



Audio



**Model
Lesson**



Board



Presentation



**Collaborative
Project**



**Skill
Builder**



**Graphic
Organizer**



Image



**Virtual
Lab**



SOS



**FUN-
damental**



animation