

Stability and Change on Earth Unit 1 Guide

What's next!	What am I learning?
<p>Unit Goal:</p> <p>Students will understand the ways that human activities affect Earth's systems.</p>	<p>Essential Questions:</p> <ul style="list-style-type: none"> • Why aren't minerals and groundwater evenly distributed across the world? • How can we predict and prepare for natural disasters? • How might we treat resources if we thought about the Earth as a spaceship on an extended survey of the solar system? • How can basic chemistry be used to explain the mechanisms that control the global temperature?
Skills	Helpful Resources
<p>Students will be able to:</p> <ul style="list-style-type: none"> • Construct a scientific explanation based on evidence for how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes. • Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects. • Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems. • Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century. • Argue from evidence the necessity of a policy change that affects global warming. 	<ul style="list-style-type: none"> • NASA's Climate Kids <ul style="list-style-type: none"> ◦ https://climatekids.nasa.gov/ • World Meters <ul style="list-style-type: none"> ◦ http://www.worldometers.info/ • A Student's Guide to Global Climate Change <ul style="list-style-type: none"> ◦ https://www3.epa.gov/climatechange/kids/index.html

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Inheritance and Variation of Traits Unit 3 Guide

<p style="text-align: center;">What's next!</p>	<p style="text-align: center;">What am I learning?</p>
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<p>Unit Goal:</p> <p>Students will understand that heredity explains why offspring resemble, but are not identical to, their parents and that it is a unifying biological principle.</p>	<p>Essential Questions:</p> <ul style="list-style-type: none"> • How do organisms grow, develop, and reproduce? • How can you develop a model showing reproductive variations?
<p style="text-align: center;">Skills</p>	<p style="text-align: center;">Helpful Resources</p>
<p>Students will be able to:</p> <ul style="list-style-type: none"> • Develop and use a model to describe why structural changes to genes (mutations) located on chromosomes may result in harmful, beneficial, or neutral effects to the structure and function of the organism. • Develop and use a model to describe why asexual reproduction results in offspring with identical genetic information. • Develop and use a model to describe why sexual reproduction results in offspring with genetic variation. • Use models such as Punnett squares, diagrams, and simulations to describe the cause-and effect-relationship of gene transmission from parent(s) to offspring and resulting genetic variation. • Analyze phenotypes to determine genotypes. • Construct an explanation of how the structure of DNA plays a role in reproduction. 	<ul style="list-style-type: none"> • <u>NJ Model Curriculum</u> - Inheritance and Variation of Traits • <u>GENIVERSE</u> Students investigate dragon phenotypes and genotypes, run breeding experiments and solve genetic problems in a virtual lab. • <u>DNA TO PROTEIN</u> Explore what DNA is and how proteins are synthesized from the genetic information stored in it. • <u>PEARSON - THE BIOLOGY PLACE</u> Bio Coach, Lab Bench and Glossary with interactive resources.

Inheritance and Variation of Traits Unit 3 Guide

What's next!

What am I learning?

<p>Unit Goal:</p> <p>Students will understand that heredity explains why offspring resemble, but are not identical to, their parents and that it is a unifying biological principle.</p>	<p>Essential Questions:</p> <ul style="list-style-type: none"> • How do organisms grow, develop, and reproduce? • How can you develop a model showing reproductive variations?
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Selection and Adaptation Unit 5 Guide

<p style="text-align: center;">What's next!</p>	<p style="text-align: center;">What am I learning?</p>
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<p>Unit Goal:</p> <p>Students will understand how genetic variation drives natural selection and the evolution of a species.</p>	<p>Essential Questions:</p> <ul style="list-style-type: none"> • How does genetic variation among organisms affect survival and reproduction? • How does the environment influence populations of organisms over multiple generations? • How can you use data to show population changes? • How has technology influenced genetics? • How can you use data to show trait changes?
<p style="text-align: center;">Skills</p>	<p style="text-align: center;">Helpful Resources</p>
<p>Students will be able to:</p> <ul style="list-style-type: none"> • 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.. • Gather and synthesize information about the technologies that have changed the way humans influence the inheritance of desired traits in organisms. • Use mathematical representations to support explanations of how natural selection may lead to increases and decreases of specific traits in populations over time. • Evaluate and communicate information to demonstrate understanding of natural selection and adaptation. • Model how people selectively breed domesticated plants and animals to produce offspring with preferred characteristics. • Identify the adaptations that have allowed humans and other "everyday organisms" to survive by exploring genetic engineering and natural selection in a population. • Analyze the patterns of natural selection in a species over several generations. 	<ul style="list-style-type: none"> • NJ Model Curriculum - Selection and Adaptation • Conflicting Selection Pressures Observe how heredity and natural selection allow a population to adapt to a changing environment. • Who Wants to Live a Million Years Interactive Survival Game • Evolution 101 Information on patterns and mechanisms of evolution. • Wards Origami Frogs Activity Kit • CK-12 Free online textbooks, videos, exercises, flashcards, and real world applications. • STATED CLEARLY Easy to follow animations.

Relationships Among Forms of Energy Unit 6 Guide

<p style="text-align: center;">What's next!</p>	<p style="text-align: center;">What am I learning?</p>
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<p>Unit Goal:</p> <p>Students will understand different forms of energy and how energy transformations explain phenomena in physical and life science.</p>	<p>Essential Questions:</p> <ul style="list-style-type: none"> • How can physics explain sports? • Is it better to have an aluminum (baseball/softball) bat or a wooden bat? • What would give you a better chance of winning a bowling match, using a basketball that you can roll really fast, or a bowling ball that you can only roll slowly? • How can you design a roller coaster?
<p style="text-align: center;">Skills</p>	<p style="text-align: center;">Helpful Resources</p>
<p>Students will be able to:</p> <ul style="list-style-type: none"> • Analyze 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. • 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. • Construct, use, and present arguments to support the claim that when the kinetic energy of an object changes, energy is transferred to, or from, the object. • Classify states and forms of energy by identifying and comparing types of energy. • Model different amounts of potential energy stored in a system by building catapults. • Model different amounts of potential energy stored in a system by manipulating distance between arrangements of objects. • Construct and interpret graphical displays of data by describing the relationship of kinetic energy to the mass of an object. • Conduct an investigation into the relationship between gravity and mass. 	<ul style="list-style-type: none"> • NJ MODEL CURRICULUM - Relationships among Forms of Energy • PHET: Free Interactive Simulations • National Energy Education Development Project - Activities that allow students to explore the forms of energy and how they are transformed.

Relationships Among Forms of Energy Unit 6 Guide

What's next!

What am I learning?

Unit Goal:

Students will understand different forms of energy and how energy transformations explain phenomena in physical and life science.

Essential Questions:

- How can physics explain sports?
- Is it better to have an aluminum (baseball/softball) bat or a wooden bat?
- What would give you a better chance of winning a bowling match, using a basketball that you can roll really fast, or a bowling ball that you can only roll slowly?
- How can you design a roller coaster?

Skills

Helpful Resources

Students will be able to:

- Analyze 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.
- 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.
- Construct, use, and present arguments to support the claim that when the kinetic energy of an object changes, energy is transferred to, or from, the object.
- Classify states and forms of energy by identifying and comparing types of energy.
- Model different amounts of potential energy stored in a system by building catapults.
- Model different amounts of potential energy stored in a system by manipulating distance between arrangements of objects.
- Construct and interpret graphical displays of data by describing the relationship of kinetic energy to the mass of an object.
- Conduct an investigation into the relationship between gravity and mass.

- [NJ MODEL CURRICULUM](#) - Relationships among Forms of Energy
- [PHET](#): Free Interactive Simulations
- [National Energy Education Development Project](#) - Activities that allow students to explore the forms of energy and how they are transformed.