

Animal Survival

Grade: 3

Subject: Science (STEAM approach)

Unit Focus:

Students explore animal evolution, adaptations, and basic genetics, examining how inherited and environmental factors influence traits and survival.

Key Understandings & Standards

- **Reproduction & Life Cycles:** Reproduction is essential; plants and animals have unique life cycles (LS1.3.B1).
- **Survival & Environment:** Environmental changes affect survival; some organisms adapt, relocate, or die (LS2.3.C1, LS4.3.C1).
- **Group Behavior:** Being part of a group can aid survival, defense, and resource acquisition (LS2.3.D1).
- **Inheritance & Traits:** Many traits are inherited, while others are influenced by the environment (LS3.3.A1-A2, LS3.3.B1-B2).
- **Fossils & Extinction:** Fossils provide evidence of extinct species and past environments (LS4.3.A1-A2).
- **Adaptation & Natural Selection:** Differences in traits can provide advantages for survival and reproduction (LS4.3.B1).
- **Biodiversity:** Habitat changes impact which organisms survive (LS4.3.D1).

Essential Question:

- Why are organisms different from one another?
-

Knowledge & Skills

- **Knowledge:**
 - Traits are inherited from parents; some influenced by environment.
 - Variations in traits can confer survival advantages.
 - Fossils reveal past life and environmental patterns.
 - Populations and biodiversity are affected by habitat changes.
- **Skills:**
 - Analyze and interpret data from fossils and observations.
 - Construct evidence-based explanations for survival and trait variation.
 - Engage in argument from evidence about environmental effects on organisms.
 - Make claims about problem-solving solutions when habitats change.

Performance Tasks

1. **3-LS3-1:** Organize and interpret data on traits of parents and offspring; identify patterns and evidence of inheritance.
 2. **3-LS3-2:** Explain how environmental factors influence traits; connect evidence to reasoning about cause-and-effect relationships in organisms.
 3. **3-LS4-1 – 3-LS4-4:** Use fossils and habitat data to construct explanations and arguments about survival, adaptation, and environmental impacts.
-

Learning Activities

- **Mystery Science:** Examine how animals change over time; compare traits of offspring and parents.
- **Women in Science:** Study Barbara McClintock and conduct a strawberry DNA experiment.
- **Pigeonetics Simulation:** Use online simulations to explore trait inheritance in pigeons.

Resources:

- BrainPop for pre-assessments
- Mystery Science activities
- Learn.Genetics simulations
- Hands-on genetics experiments

Forces in Motion

Grade: 3

Subject: Science

Interdisciplinary Approach: STEAM / Engineering Design

Unit Focus:

Students explore forces, motion, and interactions. They investigate balanced and unbalanced forces, patterns of motion, gravity, friction, and magnetic interactions. Students also design solutions using forces in engineering challenges.

Key Understandings & Standards

- **Forces and Motion:** A push or pull on an object can change its motion. Balanced forces keep objects still or moving at a constant speed; unbalanced forces cause changes in motion.
- **Patterns in Motion:** Observing patterns in motion allows predictions about future movement.
- **Interactions:** Objects can interact through contact (push/pull) or non-contact forces like magnetism.
- **Engineering Applications:** Understanding forces helps design structures and devices that solve real-world problems.

Essential Questions:

- How could you win a tug-of-war against a bunch of adults?
 - What makes bridges so strong?
 - How high can you swing on a flying trapeze?
 - What can magnets do?
 - How can you unlock a door using a magnet?
-

Knowledge & Skills

- **Knowledge:**
 - Difference between balanced and unbalanced forces.
 - Effects of gravity, friction, and motion on objects.
 - Magnetic forces and interactions.
 - Application of forces in engineering solutions.
- **Skills:**
 - Plan and conduct investigations to observe and measure motion.
 - Develop and use models to describe patterns of motion.

- Analyze cause-and-effect relationships in forces and motion.
 - Design, test, and refine solutions using knowledge of forces and interactions.
-

Performance Tasks

- **Investigation of Forces:**
 - Plan and carry out experiments with pushes, pulls, and motion to provide evidence of balanced and unbalanced forces (3-PS2-1).
 - Observe patterns in motion to make predictions about future movement (3-PS2-2).
 - **Engineering Challenges:**
 - Design a bridge or structure that withstands forces, identifying criteria and constraints (3-5-ETS1-1, ETS1-2, ETS1-3).
 - Create a device using magnets to perform a simple task, testing and refining the design.
 - **Magnetism Investigation:**
 - Ask questions about magnetic interactions between objects not in contact (3-PS2-3).
 - Apply understanding of magnetism to design practical solutions (3-PS2-4).
-

Learning Activities

1. **Balanced & Unbalanced Forces**
 - Tug-of-war investigations to see the effect of balanced vs. unbalanced forces.
 - Use toy cars, ramps, or balls to explore motion.
2. **Patterns of Motion, Gravity, & Friction**
 - Observe motion of objects on different surfaces to understand friction.
 - Predict future motion based on observed patterns.
3. **Magnets & Magnetic Forces**
 - Explore magnetic attraction and repulsion using different magnets and materials.
 - Investigate cause-and-effect relationships in non-contact interactions.
4. **Engineering with Forces**
 - Design bridges, towers, or doors using principles of forces and magnetism.
 - Test, measure, and improve designs under constraints (materials, time, safety).

Weather and Climate

Grade: 3

Subject: Science

Interdisciplinary Approach: STEAM / Project-Based Learning

Unit Focus:

Students explore the water cycle, weather, climate patterns, and natural hazards. They collect and analyze seasonal weather data, investigate global climate patterns, and design solutions to reduce the impacts of weather-related hazards.

Key Understandings & Standards

- **Weather vs. Climate:** Weather describes short-term atmospheric conditions; climate describes long-term patterns in a region.
- **Water Cycle & States of Matter:** Water moves through the environment via evaporation, condensation, precipitation, and collection.
- **Prediction & Patterns:** Local weather can be observed and predicted by analyzing data; climate patterns explain why some regions are consistently hot, cold, wet, or dry.
- **Engineering & Hazards:** Humans can design solutions to reduce impacts of weather-related hazards like windstorms or floods.

Essential Questions:

- Where do clouds come from?
 - How can we predict when it's going to storm?
 - Where's the best place to build a snow fort?
 - Why are some places always hot?
 - How can you keep a house from blowing away in a windstorm?
-

Knowledge & Skills

- **Knowledge:**
 - Water cycle stages and states of matter.
 - Seasonal and global weather patterns.
 - Natural hazards caused by weather.
 - Basic engineering solutions to reduce hazard impacts.
- **Skills:**
 - Represent and analyze weather data in tables and graphs.
 - Develop and use models of the water cycle and weather phenomena.

- Obtain, evaluate, and communicate information about climates in different regions.
 - Design, test, and improve simple solutions to reduce impacts of weather hazards.
-

Performance Tasks

- **Observation & Modeling:**
 - Represent local weather data in tables and graphs to describe typical seasonal conditions (3-ESS2-1).
 - Develop models of the water cycle to explain cloud formation, precipitation, and other weather phenomena.
 - **Engineering Design Challenge:**
 - Design a simple structure to withstand a windstorm.
 - Identify criteria and constraints (materials, time, cost) and test designs fairly.
 - Evaluate and improve designs based on testing outcomes.
 - **Data Analysis:**
 - Compare seasonal and global climate data to explain why some regions are hotter, colder, wetter, or drier than others (3-ESS2-2).
-

Learning Activities

1. **Water Cycle & States of Matter**
 - Investigate evaporation, condensation, precipitation, and collection through hands-on experiments.
 - Model the water cycle using diagrams and physical experiments.
2. **Local Weather Patterns & Prediction**
 - Record daily weather data (temperature, precipitation, wind) and graph patterns.
 - Predict weather events and storms using observations.
3. **Seasonal Weather Patterns**
 - Analyze seasonal changes to determine best locations for outdoor activities (e.g., snow forts).
4. **Climate & Global Weather Patterns**
 - Research climates in different regions and compare data.
 - Explore why some areas are always hot, cold, or wet.
5. **Natural Hazards & Engineering**
 - Design small-scale structures resistant to wind or other weather hazards.
 - Test, evaluate, and improve designs based on observations.