**Grade level: 4** | **Course Title: Science** | **Topic/Concept: Life Science**

**Time Allotment: 4 Weeks** | **Unit Sequence: 1**

## Major Concepts to be learned:

- Structure and Function
- Information Processing

## Expected Skills to be demonstrated:

- Identify simple, imcomplete, and complete metamorphosis insect life cycles.
- Label insect external body parts.
- Explain adaptations that living organisms use to survive.
- Categorize specific insects as pests or non-pests.

| PA Standards/Anchors: | Eligible Content: |
|---|---|
| 3.1.4 | 3.1.4.A<br>3.1.4.B |

## Instructional Strategies:

Direct instruction
Group discussion
Oral/Written Practice
Modeling/Demonstrating
Hands on manipulatives
Hands on experiments/Science Lab
Individual/group practice
Computer individual review
Peer tutoring
Guided practice
Cooperative learning
Videos and Note taking

## Assessments:

- Teacher observation
- Authentic tasks
- Practice/skill pages and quizzes
- Practice applications
- Student self-assessment
- Homework check
- Conferencing

**Grade level: 4** | **Course Title: Science** | **Topic/Concept: Physical Science**

**Time Allotment: 4 Weeks** | **Unit Sequence: 2**

## Major Concepts to be learned:

- Definitions of Energy
- Conservation of Energy and Energy Transfer
- Relationship Between Energy and Forces
- Energy in Chemical Processes and Everyday Life
- Wave Properties
- Electromagnetic Radiation
- Information Technologies and Instrumentation

## Expected Skills to be demonstrated:

- Use evidence to construct an explanation relating the speed of an object to the energy of that object.
- Make and communicate observations to provide evidence that energy can be transferred from place to place by sound, light, heat, and electric currents.
- Ask questions and predict outcomes about the changes in energy that occur when objects collide.
- Apply scientific ideas to design, test, and refine a device that converts energy from one form to another.
- Develop a model of waves to describe patterns in terms of amplitude and wavelength and that waves can cause objects to move.
- Develop a model to describe that light reflecting from objects and entering the eye allows objects to be seen.
- Generate and compare multiple solutions that use patterns to transfer information.

## PA Standards/Anchors:

3.2.4.
3.2.4.E
3.2.4.F
3.2.4.G

## Eligible Content:

3.2.4.A
3.2.4.B
3.2.4.C
3.2.4.D
3.2.4.E
3.2.4.F
3.2.4.G

## Instructional Strategies:

Direct instruction
Group discussion
Oral/Written Practice
Modeling/Demonstrating
Hands on manipulatives
Hands on experiments/Science Lab
Individual/group practice
Computer individual review
Peer tutoring
Guided practice
Cooperative learning
Videos and Note taking

## Assessments:

- Teacher observation
- Authentic tasks
- Practice/skill pages and quizzes
- Practice applications
- Student self-assessment
- Homework check
- Conferencing

**Grade level: 4** | **Course Title: Science** | **Topic/Concept: Earth and Space Science**

**Time Allotment: 4 Weeks** | **Unit Sequence: 3**

## Major Concepts to be learned:

- The History of Planet Earth
- Earth Materials and Systems
- Plate Tectonics and Large-Scale System Interactions
- Natural Resources
- Natural Hazards

## Expected Skills to be demonstrated:

- Identify evidence from patterns in rock formations and fossils in rock layers to support an explanation for changes in a landscape over time.
- Make observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation.
- Analyze and interpret data from maps to describe patterns of Earth's features.
- Obtain and combine information to describe that energy and fuels are derived from natural resources and their uses affect the environment.
- Generate and compare multiple solutions to reduce the impacts of natural Earth processes on humans.

## PA Standards/Anchors:

3.3.4

## Eligible Content:

3.3.4.A
3.3.4.B
3.3.4.C
3.3.4.D
3.3.4.E

## Instructional Strategies:

Direct instruction
Group discussion
Oral/Written Practice
Modeling/Demonstrating
Hands on manipulatives
Hands on experiments/Science Lab
Individual/group practice
Computer individual review
Peer tutoring
Guided practice
Cooperative learning
Videos and Note taking

## Assessments:

- Teacher observation
- Authentic tasks
- Practice/skill pages and quizzes
- Practice applications
- Student self-assessment
- Homework check
- Conferencing

**Grade level: 4** | **Course Title: Science** | **Topic/Concept: Environmental Literacy & Sustainability**

**Time Allotment: 4 Weeks** | **Unit Sequence: 4**

## Major Concepts to be learned:

- Agricultural Systems
- Environment and Society
- Watersheds and Wetlands
- Investigating Environmental Issues
- Evaluating Solutions
- Environmental Stewardship
- Environmental Justice

## Expected Skills to be demonstrated:

- Analyze how living organisms, including humans, affect the environment in which they live, and how their environment affects them.
- Make a claim about the environmental and social impacts of design solutions and civic actions, including their own actions.
- Examine ways you influence your local environment and community by collecting and displaying data.
- Develop a model to demonstrate how local environmental issues are connected to larger local environment and human systems.
- Construct an argument to support whether action is needed on a selected environmental issue and propose possible solutions.
- Critique ways that people depend on and change the environment.
- Investigate how perspectives over the use of resources and the development of technology have changed over time and resulted in conflict over the development of societies and nations.

## PA Standards/Anchors:

3.4.3-5

## Eligible Content:

| | | |
|---|---|---|
| 3.4.3-5.A | 3.4.3-5.D | 3.4.3-5.G |
| 3.4.3-5.B | 3.4.3-5.E | |
| 3.4.3-5.C | 3.4.3-5.F | |

## Instructional Strategies:

| | |
|---|---|
| Direct instruction | Peer tutoring |
| Group discussion | Guided practice |
| Oral/Written Practice | Cooperative learning |
| Modeling/Demonstrating | Videos and Note taking |
| Hands on manipulatives | |
| Hands on experiments/Science Lab | |
| Individual/group practice | |
| Computer individual review | |

## Assessments:

- Teacher observation
- Authentic tasks
- Practice/skill pages and quizzes
- Practice applications
- Student self-assessment
- Homework check
- Conferencing

**Grade level: 4** | **Course Title: Science** | **Topic/Concept: Technology & Engineering**

**Time Allotment: 4 Weeks** | **Unit Sequence: 5**

## Major Concepts to be learned:

- Applying, Maintaining, and Assessing Technological Products and Systems
- Impacts of Technology
- Influence of Society on Technological Development

## Expected Skills to be demonstrated:

- Use appropriate symbols, numbers, and words to communicate key ideas about technological products and systems.
- Examine information to assess the trade-offs to using a product or system.
- Follow directions to complete a technological task.
- Predict how certain aspects of their daily lives would be different without given technologies.
- Explain why responsible use of technology requires sustainable management of resources.
- Classify resources used to create technologies as either renewable or nonrenewable.
- Describe the helpful and harmful effects of technology.
- Determine factors that influence changes in a society's technological systems or infrastructure.
- Design solutions by safely using tools, materials, and skills.
- Explain how technologies are developed or adapted when individual or societal needs and wants change.
- Judge technologies to determine the best one to use to complete a given task or meet a need
- Demonstrate how tools and machines extend human capabilities, such as holding, lifting, carrying, fastening, separating, and computing.

## PA Standards/Anchors:

3.5.3-5

## Eligible Content:

| | | | |
|---|---|---|---|
| 3.5.3-5.A | 3.5.3-5.D | 3.5.3-5.G | 3.5.3-5.J |
| 3.5.3-5.B | 3.5.3-5.E | 3.5.3-5.H | 3.5.3-5.K |
| 3.5.3-5.C | 3.5.3-5.F | 3.5.3-5.I | 3.5.3-5.L |

## Instructional Strategies:

Direct instruction
Group discussion
Oral/Written Practice
Modeling/Demonstrating
Hands on manipulatives
Hands on experiments/Science Lab
Individual/group practice
Computer individual review
Peer tutoring
Guided practice
Cooperative learning
Videos and Note taking

## Assessments:

- Teacher observation
- Authentic tasks
- Practice/skill pages and quizzes
- Practice applications
- Student self-assessment
- Homework check
- Conferencing

**Grade level: 4** **Course Title: Science** **Topic/Concept: Technology & Engineering**

**Time Allotment: 4 Weeks** **Unit Sequence: 6**

## Major Concepts to be learned:

- Design and Design Thinking in Technology and Engineering Education

## Expected Skills to be demonstrated:

- Demonstrate essential skills of the engineering design process.
- Identify why a product or system is not working properly.
- Describe requirements of designing or making a product or system
- Evaluate the strengths and weaknesses of existing design solutions, including their own solutions.
- Practice successful design skill
- Apply tools, techniques, and materials in a safe manner as part of the design process.
- Illustrate that there are multiple approaches to design.
- Apply universal principles and elements of design.
- Evaluate designs based on criteria, constraints, and standards.
- Interpret how good design improves the human condition.

## PA Standards/Anchors:

3.5.3-5.

## Eligible Content:

| | | | |
|---|---|---|---|
| 3.5.3-5.M | 3.5.3-5.P | 3.5.3-5.S | 3.5.3-5.V |
| 3.5.3-5.N | 3.5.3-5.Q | 3.5.3-5.T | |
| 3.5.3-5.O | 3.5.3-5.R | 3.5.3-5.U | |

## Instructional Strategies:

Direct instruction
Group discussion
Oral/Written Practice
Modeling/Demonstrating
Hands on manipulatives
Hands on experiments/Science Lab
Individual/group practice
Computer individual review
Peer tutoring
Guided practice
Cooperative learning
Videos and Note taking

## Assessments:

- Teacher observation
- Authentic tasks
- Practice/skill pages and quizzes
- Practice applications
- Student self-assessment
- Homework check
- Conferencing

**Grade level: 4** | **Course Title: Science** | **Topic/Concept: Technology & Engineering**

**Time Allotment: 4 Weeks** | **Unit Sequence: 7**

## Major Concepts to be learned:

- Integration of Knowledge, Technologies, and Practices

## Expected Skills to be demonstrated:

- Describe the properties of different materials.
- Explain how various relationships can exist between technology and engineering and other content areas.
- Identify the resources needed to get a technical job done, such as people, materials, capital, tools, machines, knowledge, energy, and time
- Create a new product that improves someone's life.

## PA Standards/Anchors:

3.5.3-5.

## Eligible Content:

3.5.3-5.W 3.5.3-5.Z
3.5.3-5.X
3.5.3-5.Y

## Instructional Strategies:

Direct instruction
Group discussion
Oral/Written Practice
Modeling/Demonstrating
Hands on manipulatives
Hands on experiments/Science Lab
Individual/group practice
Computer individual review
Peer tutoring
Guided Practice
Cooperative learning
Videos and Note taking

## Assessments:

- Teacher observation
- Authentic tasks
- Practice/skill pages and quizzes
- Practice applications
- Student self-assessment
- Homework check
- Conferencing

**Grade level: 4** | **Course Title: Science** | **Topic/Concept: Technology & Engineering**

**Time Allotment: 4 Weeks** | **Unit Sequence: 8**

## Major Concepts to be learned:

- Nature and Characteristics of Technology
- Engineering Core Concepts of Technology
- History of Technology

## Expected Skills to be demonstrated:

- Create representations of the tools people made, how they cultivated to provide food, made clothing, and built shelters to protect themselves.
- Describe how a subsystem is a system that operates as a part of another larger system
- Demonstrate how simple technologies are often combined to form more complex systems.
- Explain how solutions to problems are shaped by economic, political, and cultural forces.
- Compare how things found in nature differ from things that are human-made, noting differences and similarities in how they are produced and used.
- Describe the unique relationship between science and technology, and how the natural world can contribute to the human-made world to foster innovation.
- Differentiate between the role of scientists, engineers, technologists, and others in creating and maintaining technological systems.

## PA Standards/Anchors:

3.5.3-5.

## Eligible Content:

| | | |
|---|---|---|
| 3.5.3-5.AA | 3.5.3-5.DD | 3.5.3-5.GG |
| 3.5.3-5.BB | 3.5.3-5.EE | 3.5.3-5.HH |
| 3.5.3-5.CC | 3.5.3-5.FF | |

## Instructional Strategies:

| | |
|---|---|
| Direct instruction | Peer tutoring |
| Group discussion | Guided practice |
| Oral/Written Practice | Cooperative learning |
| Modeling/Demonstrating | Videos and Note taking |
| Hands on manipulatives | |
| Hands on experiments/Science Lab | |
| Individual/group practice | |
| Computer individual review | |

## Assessments:

- Teacher observation
- Authentic tasks
- Practice/skill pages and quizzes
- Practice applications
- Student self-assessment
- Homework check
- Conferencing