

Invasive Species

Grades 5 – 8

(Activity 12, pp. 59 – 64 in 2006 edition of Project Learning Tree Activity Guide)

Subject Area: Science

Strand: Processes that Shape the Earth

Standard 2: The student understands the need for protection of the natural systems on Earth.

Benchmarks:

- **Grades 3-5:** No applicable benchmarks.
- **Grades 6-8:** Knows the positive and negative consequences of human action on the Earth's systems. [SC.D.2.3.2]

Strand: How Living Things Interact with Their Environment

Standard 1: The student understands the competitive, interdependent, cyclic nature of living things in the environment.

Benchmarks:

- **Grades 3-5:** Knows that living things compete in a climatic region with other living things and that structural adaptations make them fit for an environment. [SC.G.1.2.2]
- **Grades 6-8:** Knows that biological adaptations include changes in structures, behaviors, or physiology that enhance reproductive success in a particular environment. [SC.G.1.3.2]

Standard 2: The student understands the consequences of using limited natural resources.

Benchmarks:

- **Grades 3-5:** Knows that all living things must compete for Earth's limited resources; organisms best adapted to compete for the available resources will be successful and pass their adaptations (traits) to their offspring. [SC.G.2.2.1]
- **Grades 3-5:** Understands that changes in the habitat of an organism may be beneficial or harmful. [SC.G.2.2.3]
- **Grades 6-8:** Knows that all biotic and abiotic factors are interrelated and that if one factor is changed or removed, it impacts the availability of other resources within the system. [SC.G.2.3.2]

- **Grades 6-8:** Knows that a brief change in the limited resources of an ecosystem may alter the size of a population or the average size of individual organisms and that long-term change may result in the elimination of animal and plant populations inhabiting the Earth. [SC.G.2.3.3]
- **Grades 6-8:** Understands that humans are part of an ecosystem and their activities may deliberately or inadvertently alter the equilibrium in ecosystem. [SC.G.2.3.4]

Strand: The Nature of Science

Standard 1: The student uses the scientific processes and habits of mind to solve problems.

Benchmarks:

- **Grades 3-5:** Knows that to work collaboratively, all team members should be free to reach, explain, and justify their own individual conclusions. [SC.H.1.2.3]
- **Grades 3-5:** Knows that a successful method to explore the natural world is to observe and record, and then analyze and communicate the results. [SC.H.1.2.2] ▲
- **Grades 3-5:** Knows that to compare and contrast observations and results is an essential skill in science. [SC.H.1.2.4]
- **Grades 6-8:** No applicable benchmarks.

Standard 2: The student understands that most natural events occur in comprehensible, consistent patterns.

Benchmarks:

- **Grades 3-5:** No applicable benchmarks.
- **Grades 6-8:** Recognizes that patterns exist within and across systems. [SC.H.2.3.1]
- **Grades 6-8:** Knows that through the use of science processes and knowledge, people can solve problems, make decisions, and form new ideas. [SC.H.3.2.4]

Subject Area: Language Arts

Strand: Reading

Standard 2: The student constructs meaning from a wide range of texts.

Benchmarks:

- **Grades 3-5:** Reads text and determines the main idea or essential message, identifies relevant supporting details and facts, and arranges events in chronological order. [L.A.A.2.2.1]

- **Grades 3-5:** Identifies the author’s purpose in a simple text. [LA.A.2.2.2]
- **Grades 3-5:** Reads and organizes information for a variety of purposes, including making a report, conducting interviews, taking a test, and performing an authentic task. [LA.A.2.2.4]
- **Grades 3-5:** Selects and uses a variety of appropriate reference materials, including multiple representations of information such as maps, charts, and photos, to gather information for research projects. [LA.A.2.2.8]
- **Grades 6-8:** Reads text and determines the main idea or essential message, identifies relevant supporting details and facts and patterns of organization. [LA.A.2.3.1]
- **Grades 6-8:** Locates, organizes, and interprets written information for a variety of purposes, including classroom research, collaborative decision making, and performing a school or real-world task. [LA.A.2.3.5]
- **Grades 6-8:** Uses a variety of reference materials, including indexes, magazines, newspapers, and journals, and tools, including card catalogs and computer catalogs to gather information for research topics. [LA.A.2.3.6]

Strand: Writing

Standard 1: The student uses writing processes effectively.

Benchmarks:

Grades 3-5: Prepares for writing by recording thoughts, focusing on central idea, grouping related ideas, and identifying the purpose for writing. [LA.B.1.2.1] *

Grades 3-5: Produces final documents that have been edited for correct spelling; correct use of punctuation, including commas in series, dates, and addresses, and beginning and ending quotation marks; correct capitalization of proper nouns; correct paragraph indentation; correct usage of subject/verb agreement, verb and noun forms, and sentence structure; and correct formatting according to instructions. [LA.B.1.2.3] *

Grades 6-8: Organizes information before writing according to the type and purpose of writing. [LA.B.1.3.1] *

Grades 6-8: Produces final documents that have been edited for correct spelling; correct punctuation, including commas, colons, and semicolons; correct capitalization; effective sentence structure; correct common usage, including subject-verb agreement, common noun-pronoun agreement, common possessive forms, and with a variety of sentence structures, including parallel structure; and correct formatting. [LA.B.1.3.3] *

Standard 2: The student writes to communicate ideas and information effectively.

Benchmarks:

- **Grades 3-5:** Writes notes, comments, and observations that reflect comprehension of content and experiences from a variety of media. [LA.B.2.2.1]
- **Grades 3-5:** Writes for a variety of occasions, audiences, and purposes. [LA.B.2.2.3]
- **Grades 3-5:** Uses electronic technology, including word-processing software and electronic encyclopedias, to create, revise, retrieve, and verify information. [LA.B.2.2.4]
- **Grades 6-8:** Writes text, notes, outlines, comments, and observations that demonstrate comprehension of content and experiences from a variety of media. [LA.B.2.3.1]
- **Grades 6-8:** Selects and uses appropriate formats for writing, including narrative, persuasive, and expository formats according to the intended audience, purpose, and occasion. [LA.B.2.3.3] *
- **Grades 6-8:** Uses electronic technology including databases and software to gather information and communicate new knowledge. [LA.B.2.3.4]

Strand: Listening, Viewing, and Speaking

Standard 2: The student uses viewing strategies effectively

Benchmarks:

Grades 3-5: No applicable benchmarks.

Grades 6-8: Uses movement, placement, juxtaposition, gestures, silent periods, facial expressions, and other nonverbal cues to convey meaning to an audience. [LA.C.2.3.2] *

Standard 3: The student uses speaking strategies effectively.

Benchmarks:

- **Grades 3-5:** Speaks clearly at an understandable rate and uses appropriate volume. [LA.C.3.2.1]*
- **Grades 3-5:** Speaks for specific occasions, audiences, and purposes, including conversations, discussions, projects, and informational or imaginative presentations. [LA.C.3.2.3] *
- **Grades 3-5:** Uses eye contact and gestures that engage the audience. [LA.C.3.2.4]*
- **Grades 3-5:** Participates as a contributor and occasionally acts as a leader in a group discussion. [LA.C.3.2.5]
- **Grades 3-5:** Organizes a speech using a basic beginning, middle, and end. [LA.C.3.2.6]*

- **Grades 6-8:** Understands how volume, stress, pacing, and pronunciation can positively or negatively affect an oral presentation. [LA.C.3.3.1]*
- **Grades 6-8:** Speaks for various occasions, audiences, and purposes, including conversations, discussions, projects, and informational, persuasive, or technical presentations. [LA.C.3.3.3]*

Strand: Language

Standard 2: The student understands the power of language.

Benchmarks:

- **Grades 3-5:** Understands that word choices can shape reactions, perceptions, and beliefs. [LA.D.2.2.1]*
- **Grades 3-5:** Selects and uses appropriate technologies to enhance efficiency and effectiveness of communications. [LA.D.2.2.4]*
- **Grades 6-8:** Selects language that shapes reactions, perceptions, and beliefs. [LA.D.2.3.1]*
- **Grades 6-8:** Uses literary devices and techniques in the comprehension and creation of written, oral, and visual communications. [LA.D.2.3.2] *
- **Grades 6-8:** Incorporates audiovisual aids in presentations. [LA.D.2.3.5]*

Strand: Literature

Standard 2: The student responds critically to fiction, nonfiction, poetry, and drama.

Benchmarks:

- **Grades 3-5:** Recognizes cause-and-effect relationships in literary texts. [LA.E.2.2.1]⁺⁺
- **Grades 3-5:** Identifies the major theme in a story or nonfiction text. [LA.E.2.2.4]
- **Grades 6-8:** No applicable benchmarks.

Subject Area: Mathematics (*Applies to fourth enrichment activity only; benchmark varies dependent upon student methodology for solution.*)

Strand: Number Sense, Concepts, and Operations

Standard 3: The student understands the effects of operations on numbers and the relationship among these operations, selects appropriate operations, and computes for problem solving.

Benchmarks:

- **Grades 3-5:** Understands and explains the effects of addition, subtraction, and multiplication on whole numbers, decimals, and fractions, including mixed numbers, and the effects of division on whole numbers, including inverse relationship of multiplication and division. [MA.A.3.2.1]
- **Grades 3-5:** Selects the appropriate operation to solve specific problems involving addition, subtraction, and multiplication of whole numbers, decimals, and fractions, and division of whole numbers. [MA.A.3.2.2]
- **Grades 3-5:** Adds, subtracts, and multiplies whole numbers, decimals, fractions, including mixed numbers, and divides whole numbers to solve real-world problems, using appropriate methods of computing, such as mental mathematics, paper and pencil, and calculator. [MA.A.3.2.3]
- **Grades 6-8:** Understands and explains the effects of addition, subtraction, multiplication, and division on whole numbers, fractions, including mixed numbers and decimals, including the inverse relationships of positive and negative numbers. [MA.A.3.3.1]
- **Grades 6-8:** Selects the appropriate operation to solve problems involving addition, subtraction, multiplication, and division of rational numbers, ratios, proportions, and percents, including the appropriate application of the algebraic order of operations. [MA.A.3.3.2]
- **Grades 6-8:** Adds, subtracts, multiplies, and divides whole numbers, decimals, fractions, including mixed numbers, to solve real-world problems, using appropriate methods of computing, such as mental mathematics, paper and pencil, and calculator. [MA.A.3.3.3]

Strand: Algebraic Thinking

Standard 1: The student describes, analyzes, and generalizes a wide variety of patterns, relations, and functions.

Benchmarks:

- **Grades 3-5:** Generalizes a pattern, relationship, or function to explain how a change in one quantity results in a change in another. [MA.D.1.2.2]
- **Grades 6-8:** Creates and interprets tables, graphs, equations, and verbal descriptions to explain cause-and-effect relationships. [MA.D.1.3.2]

Standard 2: The student uses expressions, equations, graphs, and formulas to represent and interpret situations.

Benchmarks:

- **Grades 3-5:** Represents a given simple problem situation using diagrams, models, and symbolic expressions translated from verbal phrases, or verbal phrases translated from symbolic expressions, etc. [MA.D.2.2.1]
- **Grades 3-5:** Uses informal methods, such as physical models and graphs, to solve real-world problems involving equations and inequalities. [MA.D.2.2.2]
- **Grades 6-8:** Represents and solves real-world problems graphically, with algebraic expressions, equations, and inequalities. [MA.D.2.3.1]
- **Grades 6-8:** Uses algebraic problem-solving strategies to solve real-world problems involving linear equations and inequalities. [MA.D.2.3.2]

Strand: Data Analysis and Probability

Standard 1: The student understands and uses the tools of data analysis for managing information.

Benchmarks:

- **Grades 3-5:** Solves problems by generating, collecting, organizing, displaying, and analyzing data using histograms, bar graphs, circle graphs, line graphs, pictographs, and charts. [MA.E.1.2.1]
- **Grades 6-8:** Collects, organizes, and displays data in a variety of forms, including tables, line graphs, charts, and bar graphs, to determine how different ways of presenting data can lead to different interpretations. [MA.E.1.3.1]

Subject Area: Social Studies

Strand: Time, Continuity, and Change (History)

Standard 1: The student understands historical chronology and the historical perspective.

Benchmarks:

- **Grades 3-5:** Understands how individuals, ideas, decisions, and events can influence history. [SS.A.1.2.1]
- **Grades 6-8:** Understands how patterns, chronology, sequencing (including cause and effect), and the identification of historical periods are influenced by frames of reference. [SS.A.1.3.1]

Strand: People, Places, and Environments (Geography)

Standard 1: The student understands the world in special terms.

Benchmarks:

- **Grades 3-5:** Uses maps, globes, charts, graphs, and other geographic tools including map keys and symbols to gather and interpret data and to draw conclusions about physical patterns. [SS.B.1.2.1]
- **Grades 6-8:** Uses various map forms (including thematic maps) and other geographic representations, tools, and technologies to acquire, process, and report geographic information including patterns of land use, connections between places, and patterns and processes of migration and diffusion. [SS.B.1.3.1]
- **Grades 6-8:** Uses mental maps to organize information about people, places, and environments. [SS.B.1.3.2]
- **Grades 6-8:** Understands ways in which regional systems are interconnected. [SS.B.1.3.6]
- **Grades 6-8:** Understands the spatial aspects of communication and transportation systems. [SS.B.1.3.7]

Standard 2: The student understands the interactions of people and the physical environment.

Benchmarks:

- **Grades 3-5:** Understands how human activity affects the physical environment. [SS.B.2.2.3]
- **Grades 3-5:** Understands how factors such a population growth, human migration, improved methods of transportation and communication, and economic development affect the use and conservation of natural resources. [SS.B.2.2.4]
- **Grades 6-8:** Understands the patterns and processes of migration and diffusion throughout the world. [SS.B.2.3.1]
- **Grades 6-8:** Knows the human and physical characteristics of different places in the world and how these characteristics change over time. [SS.B.2.3.2]
- **Grades 6-8:** Understands the environmental consequences of people changing the physical environment in various world locations. [SS.B.2.3.6]
- **Grades 6-8:** Understands how the interaction between physical and human systems affects current conditions on Earth. [SS.B.2.3.9]

Strand: Government and the Citizen (Civics and Government) (Applies to first enrichment activity only.)

Standard 2: The student understands the role of the citizen in American democracy.

Benchmarks:

- **Grades 3-5:** Understands the importance of participation through community service, civic improvement, and political activities. [SS.C.2.2.1]
- **Grades 3-5:** Understands why personal responsibility (e.g., taking advantage of the opportunity to be educated) and civic responsibility (e.g., obeying the law and respecting the rights of others) are important. [SS.C.2.2.2]
- **Grades 6-8:** Understands the importance of participation in community service, civic improvement, and political activities. [SS.C.2.3.6]

Strand: Production, Distribution, and Consumption (Economics)

Standard 1: The student understands how scarcity requires individuals and institutions to make choices about how to use available resources.

Benchmarks:

Grades 3-5: Understands that all decisions involve opportunity costs and that making effective decisions involves considering the costs and the benefits associated with alternative choices. [SS.D.1.2.1]

Grades 6-8: No applicable benchmarks.

Subject Area: The Arts (*Specific benchmarks vary depending upon student method of presentation.*)

-- **Dance**

Strand: Skills and Techniques

Standard 1: The student identifies and demonstrates movement elements in performing dance.

Benchmarks:

- **Grades 3-5:** No applicable benchmarks.
- **Grades 6-8:** Creates movement patterns that convey ideas, thoughts, or feelings. [DA.A.1.3.3]

Strand: Creation and Communication

Standard 1: The student understands dance is a way to create meaning.

Benchmarks:

- **Grades 3-5:** Creates a dance that communicates experiences and ideas of personal significance. [DA.B.1.2.3]

- **Grades 6-8:** Creates dance that reflects and communicates experiences and ideas of personal significance. [DA.B.1.3.3]

Strand: Applications to Life

Standard 2: The student makes connections between dance and other disciplines.

Benchmarks:

- **Grades 3-5:** Creates a movement study that illustrates a concept from another discipline (e.g. creates patterns from math forms such as ABA). [DA.E.2.2.1]
- **Grades 6-8:** Understands the ways in which dance and other disciplines can express similar ideas (e.g., how they can “comment” on political and social issues.) [DA.E.2.3.1]
- **Grades 6-8:** Understands the ways that various media (e.g., technology, music, and visual art) can be used to reinforce, enhance, or alter a dance idea. [DA.E.2.3.2]

-- Music

Strand: Creation and Communication

Standard 2: The student composes and arranges music within specific guidelines.

Benchmarks:

- **Grades 3-5:** Understands how composed music communicates text, ideas, meanings, and emotion. [MU.B.2.2.2]
- **Grades 6-8:** Composes short pieces with others that express an idea or a feeling. [MU.B.2.3.3]

Strand: Applications to Life

Standard 1: The student understands the relationship between music, the other arts, and disciplines outside the arts.

Benchmarks:

- **Grades 3-5:** Understands the relationship between music and other subjects (e.g. between folk songs and historical events). [MU.E.1.2.2]
- **Grades 6-8:** Understands the relationships between music and other subjects and how each expresses events, emotions, and ideas (e.g., sadness, as expressed in music: dirge; in dance: ending of Swan Lake; and in visual art: Pieta). [MU.E.1.3.1]

Standard 2: The student understands the relationship between music and the world beyond the school setting.

Benchmarks:

- **Grades 3-5:** Knows multiple uses of music in the media (e.g., to create a dramatic atmosphere or for advertising or entertainment). [MU.E.2.2.1]
- **Grades 6-8:** Understands the influence of daily music experiences (e.g., television and radio commercials and background music in public places) in one's personal life. [MU.E.2.3.1]
- **Grades 6-8:** Understands the uniqueness of music and its importance in society (e.g., public and private rituals). [MU.E.2.3.4]

-- Theatre

Strand: Skills and Techniques

Standard 1: The student acts by developing, communicating, and sustaining characters in improvisation and formal or informal productions.

Benchmarks:

- **Grades 3-5:** Creates imagined characters, relationships, and environments, using basic acting skills (e.g., breath control, diction, concentration, and control of isolated body parts). [TH.A.1.2.1]
- **Grades 6-8:** Develops characters, relationships, and environments from written sources (e.g., plays, stories, poems, history).

Standard 2: The student directs by interpreting dramatic texts and organizing and conducting rehearsals for formal and informal productions.

Benchmarks:

- **Grades 3-5:** No applicable benchmarks.
- **Grades 6-8:** Uses the elements of dramatic form (e.g., plot, character, dialogue, conflict, and resolution, and setting) to stage a play. [TH.A.2.3.1]

Standard 3: The student designs, conceptualizes, and interprets formal and informal productions.

Benchmarks:

- **Grades 3-5:** No applicable benchmarks.
- **Grades 6-8:** Develops and uses technical sound effects such as microphones, synthesizers, tapes, and CDs to emphasize and enhance the meaning of a play. [TH.A.3.3.2]

Strand: Aesthetic and Critical Analysis

Standard 1: The student analyzes, criticizes, and constructs meaning from formal and informal theatre, film, television, and electronic media.

Benchmarks:

- **Grades 3-5:** Know how theatre uses visual elements (e.g., set design and costuming), sound (e.g., sound effects and vocal inflection), and movement (e.g., staging and character portrayal) to communicate. [TH.D.1.2.1]
- **Grades 6-8:** No applicable benchmarks.

Strand: Application to Life

Standard 1: The student understands applications of the role of theatre, film, television, and electronic media in everyday life.

Benchmarks:

- **Grades 3-5:** Understands the emotional and social impact of theatre, film and television on an individual's life and community and in other cultures. [TH.E.1.2.1]
- **Grades 3-5:** Collaborates in the construction of formal and informal productions (e.g., shows respect and uses proper social skills with peers). [TH.E.1.2.4]
- **Grades 6-8:** Understands the reasons for personal reactions and audience reactions to various media and multiple art forms (e.g., staging environment, past experiences, and culture). [TH.E.1.3.2]
- **Grades 6-8:** Understands the value of collaboration in creating a theatrical production. [TH.E.1.3.4]

-- Visual Arts

Strand: Skills and Techniques

Standard 1: The student understands and applies media, techniques, and process.

Benchmarks:

- **Grades 3-5:** Uses and organizes two-dimensional and three-dimensional media, techniques, tools, and processes to produce works of art that are derived from personal experience, observation, or imagination. [VA.A.1.2.1]
- **Grades 3-5:** Uses good craftsmanship in a variety of two-dimensional and three-dimensional media. [VA.A.1.2.4]
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- **Grades 6-8:** Understands what makes various organizational elements and principles of design effective and ineffective in the communication of ideas. [VA.A.1.3.3]
- **Grades 6-8:** Creates two-dimensional and three-dimensional works of art that reflect competency and craftsmanship. [VA.A.1.3.4]

Strand: Creation and Communication

Standard 1: The student creates and communicates a range of subject matter, symbols, and ideas using knowledge of structures and functions of visual arts.

Benchmarks:

- **Grades 3-5:** Understands that subject matter used to create unique works of art can come from personal experience, observation, imagination, and themes. [VA.B.1.2.1]
- **Grades 3-5:** Understands what makes art media, techniques, and processes effective or ineffective in communicating various ideas. [VA.B.1.2.2]
- **Grades 3-5:** Uses the elements of art and the principles of design with sufficient manipulative skills, confidence, and sensitivity when communicating ideas. [VA.B.1.2.4]
- **Grades 6-8:** Know how different subjects, themes, and symbols (through context, value, and aesthetics) convey intended meanings or ideas in works of art. [VA.B.1.3.1]
- **Grades 6-8:** Knows how the qualities and characteristics of art media, techniques, and processes can be used to enhance communication of experiences and ideas. [VA.B.1.3.2]
- **Grades 6-8:** Understands and distinguishes multiple purposes for creating works of art. [VA.B.1.3.3]
- **Grades 6-8:** Knows and uses the interrelated elements of art and the principles of design to improve the communication of ideas. [VA.B.1.3.4]

* Standard and Benchmarks apply conditionally per type of student presentation.

⁺⁺ Applies only to Reading Connections activities.

[▲] Applies only to Enrichment activities.