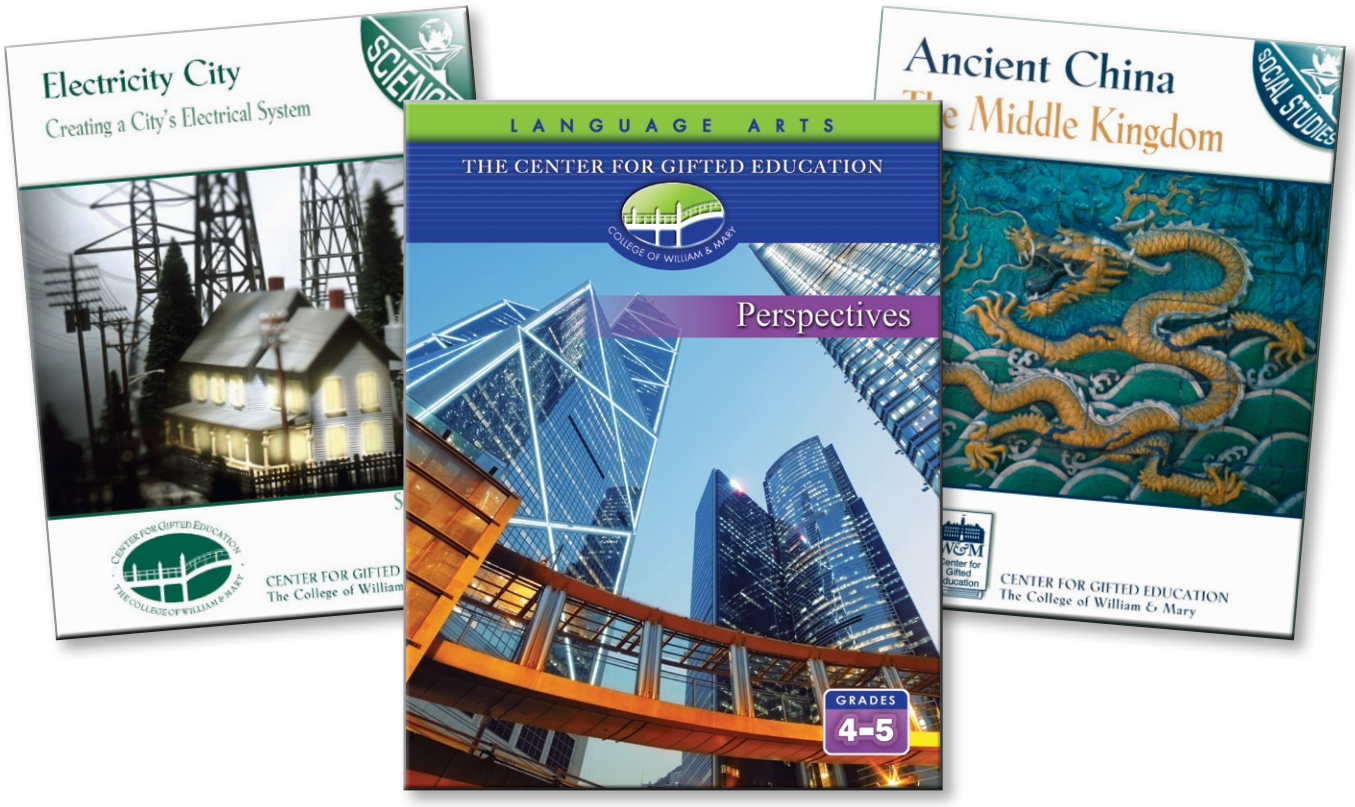
THE CENTER FOR GIFTED EDUCATION

COLLEGE OF WILLIAM & MARY



Science | **Language Arts** | **Social Studies**

CURRICULUM OVERVIEW

Grades 1-12

Kendall Hunt

Research-Based Curricula for Gifted Students

The Center for Gifted Education curriculum was carefully developed through years of research and field testing. The curriculum is based on an integrated curriculum model that matches key characteristics of gifted students to the curriculum design and ensures a cohesive approach to learning across all disciplines and units.

Integrated Curriculum Model

The Center for Gifted Education materials are grounded in the Integrated Curriculum Model (ICM). This model is designed to respond to gifted learners' characteristics of precocity, intensity, and complexity.

This model represents three interrelated dimensions, including: 1) advanced content, 2) higher level processes and product development, and 3) issues and themes connected to interdisciplinary concepts.

Teaching Models

Within the curriculum units, specific teaching models, including graphic organizers, are used to strengthen students' critical thinking skills. Each unit incorporates several models, and these are flexible enough to be adapted to many situations within and outside the scope of the unit.

Leader in Gifted Education

The College of William and Mary's Center for Gifted Education is a leader in the development of curriculum materials and instructional and assessment approaches for gifted learners.

Award Winning

The Center for Gifted Education and its curriculum materials have been recognized by the United States Department of Education and the National Association for Gifted Children (NAGC) for their quality materials.

Refer to the discipline overview pages to find which units have been awarded the NAGC's Curriculum Division Award for Outstanding Curriculum.

Engaging and Meaningful Units

Using the ICM as its foundation, teams of content specialists and educators wrote and field-tested the variety of units in the areas of language arts, science, and social studies.

"The work produced at the **Center for Gifted Education** has contributed greatly to the effectiveness of gifted education services in local schools. To have research-based curriculum materials for high ability and gifted learners readily available for practitioner use has contributed greatly to the legitimacy of our work. In particular, the Center's materials produced to enhance the abilities of at-risk gifted learners have filled a great need for students and teachers across the nation."

— Joy Davis, Gifted Coordinator
Hampton City Public Schools, VA

Strong Teacher Support

Curriculum materials were developed with the educator in mind, providing all the necessary tools to teach the high- ability learner.

A variety of assessment options are available throughout the curriculum. Resources and rubrics help teachers guide instruction while accurately assessing student progress.

Professional development workshops are available to provide teachers support in content, modeling, and implementation.

Celebrating Twenty Five Years of Excellence

The Center for Gifted Education, under the direction of Dr. Joyce VanTassel-Baska, has been in operation as part of The College of William and Mary's School of Education since 1987. The Center has been the recipient of 25 years of continuous funding from federal education grants for curriculum development, research, and dissemination.

From the Center's inception, one of its major emphases has been the development of exemplary curriculum frameworks and units of study for classroom use with high-ability learners.

Curriculum development in science, language arts, and social studies, has involved teams of content specialists and educators in writing and field-testing units. Many Center materials have been recognized for their quality and enhancement of student achievement by the United States Department of Education and the National Association for Gifted Children.

Through the use of a research-based conceptual framework, the Integrated Curriculum Model (ICM), and repeated use of advanced graphic organizers and models within each core content domain, positive outcomes in student achievement have been noted.

Teachers and students in private and public school districts, including rural, urban, and suburban schools, in all 50 states nationwide, as well as 28 countries/territories, have successfully implemented Center materials. Presentations about curriculum efficacy have been conducted at state, national, and international conferences. Staff members frequently conduct implementation workshops for educators across the country and abroad.

Professional development workshops for teachers provide participants with content, modeling, and practice involving the core strategies of each unit as well as an introduction to unit-specific resources and activities. Annual workshops are also provided twice a year on the College of William and Mary's campus to address curriculum, instruction, and assessment for gifted learners.

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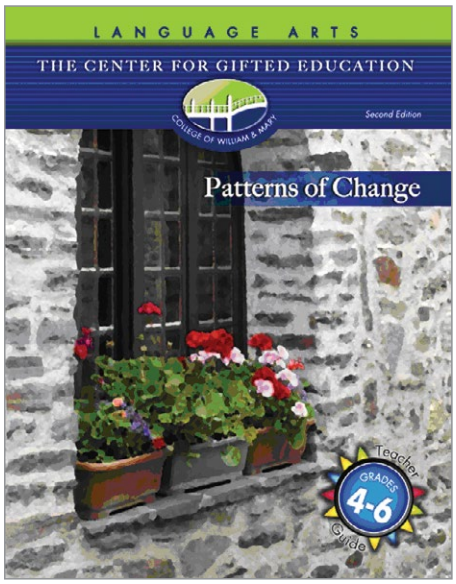
For more information or to order, call 1-800-542-6657 or visit kendallhunt.com/prek12

Visit cfge.wm.edu for more information on the Center for Gifted Education.

TEACHER MATERIALS

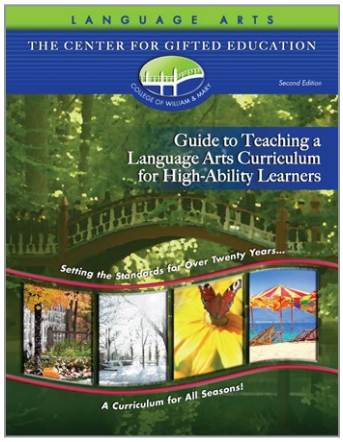


Unit Teacher Guide

Several curriculum topics are available for Language Arts, Science and Social Studies units. Each Unit Teacher Guide includes:

- Lessons
- Glossaries
- Handouts/Teacher Resource Pages
- Letter to Teacher
- Letter to Family/Parents
- Implementation Guidelines
- Appendices
- Rubrics
- References and Resources

Language Arts

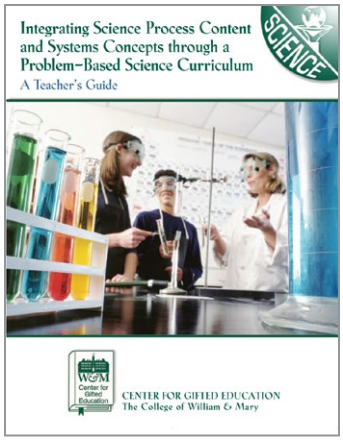


Guide to Teaching a Language Arts Curriculum

A comprehensive guide providing background and instruction for administrators and teachers:

- Introduction
- Curriculum Framework
- Support for Special Needs
- Implementation
- Assessment
- Resources
- FAQ's

Science

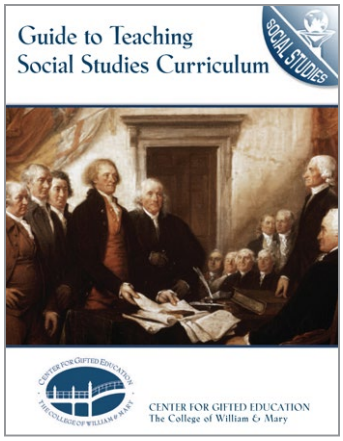


Guide to Teaching a Problem-Based Science Curriculum

A comprehensive guide providing background and instruction for administrators and teachers:

- Introduction
- Curriculum Framework
- Implementation
- Assessment
- Support Structures

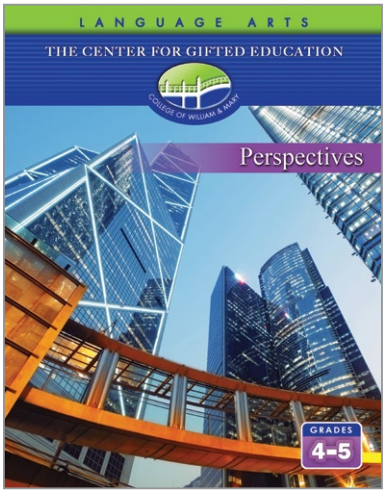
Social Studies



Guide to Teaching a Social Studies Curriculum

A comprehensive guide providing background and instruction for administrators and teachers:

- Introduction
- Curriculum Framework
- Implementation
- References



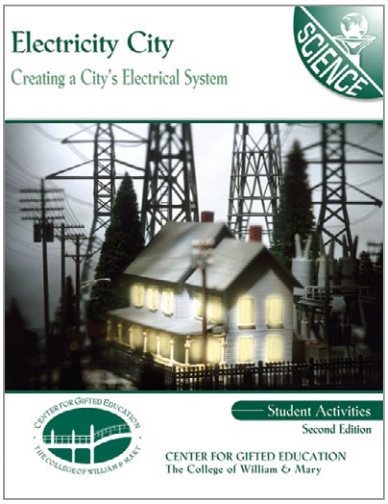
Language Arts

Student Guides

Student guides are available for each Language Arts unit. These guides include Student Activity Pages that coincide with the Teacher Guide lessons and each unit's short stories and poems. The guides engage students in exploring carefully selected, challenging works of literature from various times, cultures, and genres.

- Letter to Student
- Model Overview
- Glossary of Literary Terms
- Vocabulary List
- Short Stories
- Poems
- Student Activity Pages

Also available from Kendall Hunt: Trade books to support Language Arts units



Science

Student Activity Booklets

Student books are available for each science unit. These books provide students an opportunity to record information about the problems as they progress through the units. Only available in sets of 10. Designed to be consumable.

- Problem Log Questions
- Student Brainstorming Guides
- Experimental Design Diagrams
- Student Experiment Protocols
- Student Laboratory Reports
- Glossary
- Laboratory Safety Precautions

Save time and money with Kendall Hunt materials kits that support science units.

Overview of the Integrated Curriculum Model

The Integrated Curriculum Model (ICM), a theoretical model of curriculum design for gifted learners (Figure 1), emphasizes the inclusion of advanced processes, advanced content, and connections to overarching concepts through themes and issues as the foundation for curriculum development.

The greatest student learning occurs when emphases are given to each of these dimensions within a given curriculum unit (VanTassel-Baska, 2001). The ICM was derived based on the characteristics of gifted students and how curriculum may be designed to best match the characteristics of these learners. For example, since gifted students are precocious learners, advanced content within a given subject area will provide opportunities for students to develop expertise in the content domains.

The intensity of gifted students can be addressed through the provision of advanced processes and organizers that help them reason through situations and think critically about given advanced topics and real world issues. Moreover, since many gifted students thrive on complexity, the provision of interdisciplinary connections and the linkage of content to issues and themes is a necessary component of curriculum for these students.

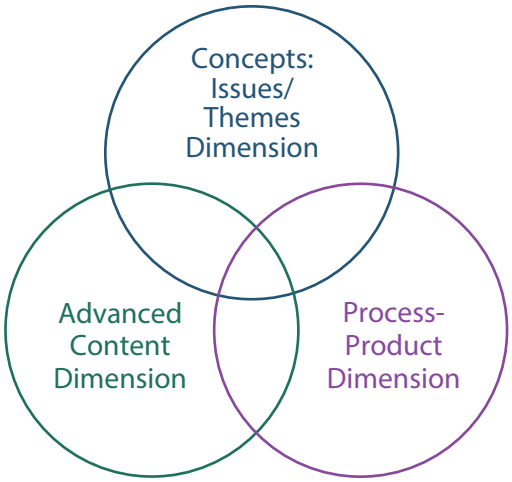


Figure 1: Integrated Curriculum Model (ICM)

The three components of the ICM (advanced content, issues/themes connected to overarching concepts, and advanced processes/products) comprise a framework for curriculum design and differentiation.

Advanced Content Dimension

A curriculum for the gifted needs to be designed with an advanced content focus that incorporates subject matter that is two to three grade levels above what is normally expected of a typical learner. Advanced content is derived based on standards within a given discipline. These educational standards serve as the basis for content inclusion.

In addition to advanced content standards, students need to understand how the advanced content is used to develop expertise within a given domain by using tools of the discipline and developing skills used by experts.

Process-Product Dimension

Gifted learners show great intensity and the process-product dimension of the ICM supports students' concentration and passion by providing students with higher-level thinking challenges and reasoning skills. Advanced processes and products that would be appropriate for any content-based curriculum for gifted learners include problem-based learning, issue-based research, real-world connections, oral and written presentations to real-world audiences, and situation or issue reasoning and analysis.

Issues/Themes Dimension: Connecting to Overarching Concepts

Students who are gifted thrive on complex and ambiguous situations. These students need a curriculum that helps them integrate isolated pieces of information in a cohesive way. The issues/themes dimension provides a framework for students to connect observations and facts to an overarching concept. These concepts span multiple disciplines and allows students to gain an in-depth understanding of their world (American Association for the Advancement of Science, 1993).

Overarching concepts provide students with a framework to guide learning and bring order to the complex and often ambiguous information they gather (National Research Council, 2005). Sample overarching concepts include change, systems, and cause and effect. Specific generalizations that are associated with each concept provide additional understanding.

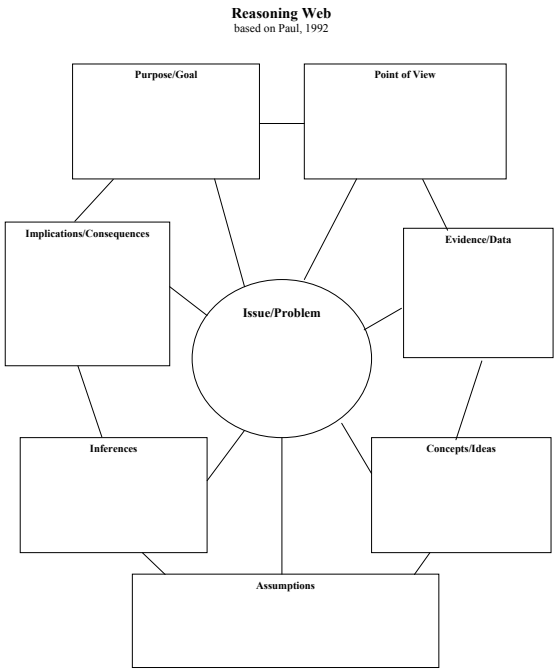
William and Mary Teaching Models

Within the William and Mary curriculum units, specific teaching models are used to strengthen students' critical thinking skills. Each of the models is used within the context of a particular unit of study. Each of the models is flexible and may be adapted for use in many classroom lessons.

- Literature Web
- Concept Development Model
- Hamburger Model for Persuasive Writing
- Vocabulary Web
- Reasoning Web
- Analyzing Primary Sources
- Research Model

Examples of how the ICM is used within a curriculum framework and how the teaching models relate are outlined in Table 1. Within the advanced content dimension, accelerated grade level standards and advanced organizers are vehicles to provide gifted students with advanced content in specific subject domains. Advanced instructional processes should also be used to teach students how to think, write, solve problems, and investigate major issues of importance within a given curriculum. Advanced products provide an opportunity for students to make real-world connections and practice the skills of the discipline.

Finally, overarching concepts are used to provide inter- and intra- disciplinary connections in order to help students make generalizations about the world around them. Specific examples of each of the models listed in Table 1 are further explained in each content section.



The Reasoning Web, based on Paul's Elements of Reasoning (1992), is a teaching model used to strengthen students' critical thinking skills.

Advanced Content	Advanced Process/Products	Issues/Themes: Connecting to Overarching Concepts
• Links to content standards at or above the students' grade level • Incorporates models for how students develop expertise within a given discipline (e.g., literature web, vocabulary web, concept mapping, primary document analysis)	Advanced thinking and process models include: • Reasoning Web • Reasoning Through a Situation • Issues-Based Research • Problem-Based Learning • Persuasive Writing	Issues and themes are connected to overarching concepts such as: • Systems • Change • Cause and Effect

Table 1: Examples of How the ICM is Used Within A Curriculum Framework

LANGUAGE ARTS

LANGUAGE ARTS UNITS

TITLE	1	2	3	4	5	6	7	8	9	10	11	12
Beyond Words	●	●										
Journeys and Destinations		●	●									
Literary Reflections				●	●							
Perspectives				●	●							
Patterns of Change				●	●	●						
Autobiographies and Memoirs					●	●						
Persuasion						●	●					
Courage: Connections and Reflections							●	●				
The Pursuit of Justice							●	●				
The 1940s: A Decade of Change							●	●	●			
Utopia							●	●	●			
Threads of Change in 19th Century American Literature								●	●	●		
Change Through Choices										●	●	●

Research Findings:
Students exposed to the language arts units showed significant learning gains in critical thinking and reading comprehension when compared to students who used a basal reader or teacher-created materials. In addition, students who were exposed to the language arts curriculum showed important and statistically significant gains in literary analysis and in persuasive writing.

Sub-analyses suggest that student growth in critical thinking may be bounded by the characteristics of the learner, teacher skills in critical thinking, and fidelity of curriculum implementation.

Language Arts Curriculum Overview

The William and Mary language arts units focus on analytic and interpretive skills in literature, persuasive writing skills, linguistic competency, listening/oral communication skills, reasoning skills, and understanding an overarching concept.

Through the use of graphic organizers, students are better able to write persuasively, analyze and interpret literature, understand and enhance vocabulary, develop issue-based research products and presentations, and analyze situations within a fiction or nonfiction text.

Advanced Content

The essential understandings of each language arts unit have been aligned to national standards within a given grade level as well as two to three grades above the current grade. Besides addressing the regular language arts standards, the William and Mary language arts curricula also focus on analyzing and interpreting literature, issue-based research skills, vocabulary development and analysis, and persuasive writing. Reading selections were chosen because of their readability levels, connection to an overarching concept, and multicultural emphases.

The language arts units incorporate advanced content-based thinking models such as a literature web and a vocabulary web to help students understand and analyze text and words. Students are introduced to the literature web early in each unit. For example, after reading a short story or poem, students analyze and justify key words and feelings. They are asked to describe images and symbols, identify structural elements within the story and how they contribute to the meaning, and elaborate on main ideas of the selected piece. Discussion and reflection are critical components of this advanced content organizer. Students are asked to reflect individually about a passage, share ideas with a partner, and then discuss findings in a small or whole group setting with teacher guidance and feedback.

Advanced Process-Product

The William and Mary language arts units use a variety of advanced processes and models to guide students' thinking, writing, and research as they explore quality literature and current issues. After identifying an issue, students may examine it through the lens of Paul's Reasoning Model.

Issues and Research

Advanced issue-based research opportunities are part of the advanced process/product dimension within the language arts curriculum. The issue-based research model features real-world problems and authentic data collection such as interviews and surveys. Students are taught how to distinguish between a topic and an issue and then led through a process to help them collect, analyze, and report data. Within the language arts units often the research topic is based on student choice. Sample topics may stem from an issue presented in a novel or from a current event within the school or world.

Persuasive Writing

By using a persuasive writing model, students learn to articulate ideas by providing at least three key ideas, evidence or elaboration, and an appropriate introduction and conclusion. Students who are more sophisticated in their writing and thinking may add counterpoints within the model as part of reasoning and elaboration.

Issues and Themes: Connecting to Overarching Concepts

Most of the language arts units focus on the overarching concept of change. Progressing through the units, students learn that change is everywhere, change is linked to time, change may be positive or negative, change may be perceived as orderly or random, and change may happen naturally or may be caused by people. As students read literature they identify examples of how change generalizations are illustrated in different reading passages.

Language Arts Unit Titles

* National Association for Gifted Children's Curriculum Studies Award Winner!

Beyond Words—Grades 1 – 2 *

This literature unit, organized around the study of figurative language, explores the idea that language can change the way we think about the world by creating new images and connections in our minds. The unit uses poetry and picture books as the basis for analyzing different types of figurative language, including simile, metaphor, and personification, and gives opportunities for students to create their own literary images. In addition, the unit introduces students to persuasive writing and to advanced word study, as well as providing an opportunity for students to explore how language changes over time.

Journeys & Destinations—Grades 2-3 *

This unit uses an inquiry-based approach to investigate literature in an interdisciplinary, multicultural curriculum. The guiding theme of this unit is the recognition of change as a concept that affects people and their relationships to the world around them. An open-ended approach to the discussion process is emphasized in the search for meaning in selected literature selections. Vocabulary development, writing activities, oral communication, research, and reasoning are integrated into the unit.

Literary Reflections—Grades 4 – 5 *

While all four language arts strands of literature, writing, language study, and oral communication are integrated into this unit, the core of the unit involves students interacting with literature while enhancing reading comprehension and textual analysis skills. The literature selections serve as a basis for discussion.

Perspectives—Grades 4 – 5

The guiding theme of this unit is the recognition that people have their own perspectives based on their experiences in the world around them. The literature selections of the unit will allow students the opportunity to view and study multiple perspectives. Students will reflect on their own perspectives as well as the perspectives of characters in and authors of classical literature.

Patterns of Change—Grades 4 – 6

The concept of cyclic patterns of change was chosen as the unifying theme for this unit. Selected literary works deal with cycles in nature, knowledge, history, and human life. Students are introduced to some of the important approaches and ideas of literary criticism. Students are encouraged to use journals, literature webs, essays, and visual projects to organize and express their ideas about various literary selections.

Autobiographies—Grades 5 – 6 *

In this unit, students study the concept of change by reading autobiographies of writers and by looking at change in the lives of writers and other artists. As they examine life stories and self-portraits, they study literature and examine works of art from various cultures. In order to gain insight into the development of talent, students are encouraged to explore their own identities as talented learners through discussions, research, oral presentations, and reflective writing.

Persuasion—Grades 6 – 7

This unit highlights elements of persuasion, especially as it relates to oral communication. Students must cite passages from literature to defend their points of view in discussion as well as in written arguments. Literature selections such as "The Valiant," "The Pied Piper of Hamelin," and the "Declaration of Independence" frame the basis for exploring the reasoning process through analysis and interpretation. Opportunities are presented for impromptu, informative, and persuasive speeches, debate, small and large group discussion, and critical reasoning.

Courage: Connections and Reflections—Grades 7 – 8

Courage: Connections and Reflections offers students the chance to compare and contrast their own lives with those of others. The unit explores social and historical issues by studying people, historical time periods and events, and students' own lives. Novels, short stories, poetry, art, and music will be the avenues for addressing unit goals. Students will be given numerous opportunities for reading, writing, listening, and speaking.

The Pursuit of Justice—Grades 7 – 8

This unit is about the path man has taken in his desire for justice. Students will explore the South of the 1930s in the perennial classic *To Kill a Mockingbird* by Harper Lee; they will also read some of her short stories and essays that have intrigued readers. The plight of the Little Rock Nine becomes a first-person account in *Warriors Don't Cry* by Melba Pattillo Beals. Students will read the primary source newspapers of the day to get other perspectives on how Civil Rights and integration shook the nation. They will also travel the path of the migrant ranch hand in John Steinbeck's *Of Mice and Men*. Students will also have a chance to examine poetry, songs, essays, and art that portray the pursuit of justice. Vocabulary and grammar will align with the readings. Opportunities to research, write expository pieces, and creative meaning for themselves will abound in this unit.

The 1940's: A Decade of Change—Grades 7 – 9

This unit looks at the historical events and social issues of the 1940s through the literature of the decade, including novels, short stories, poetry, essays, letters, and newspapers. Numerous opportunities for reading, writing, listening, linguistic competency, and speaking are incorporated into the unit. Each student is required to pose a hypothesis and conduct research concerning some issue of significance that arises from the literature that is studied.

Utopia—Grades 7 – 9 *

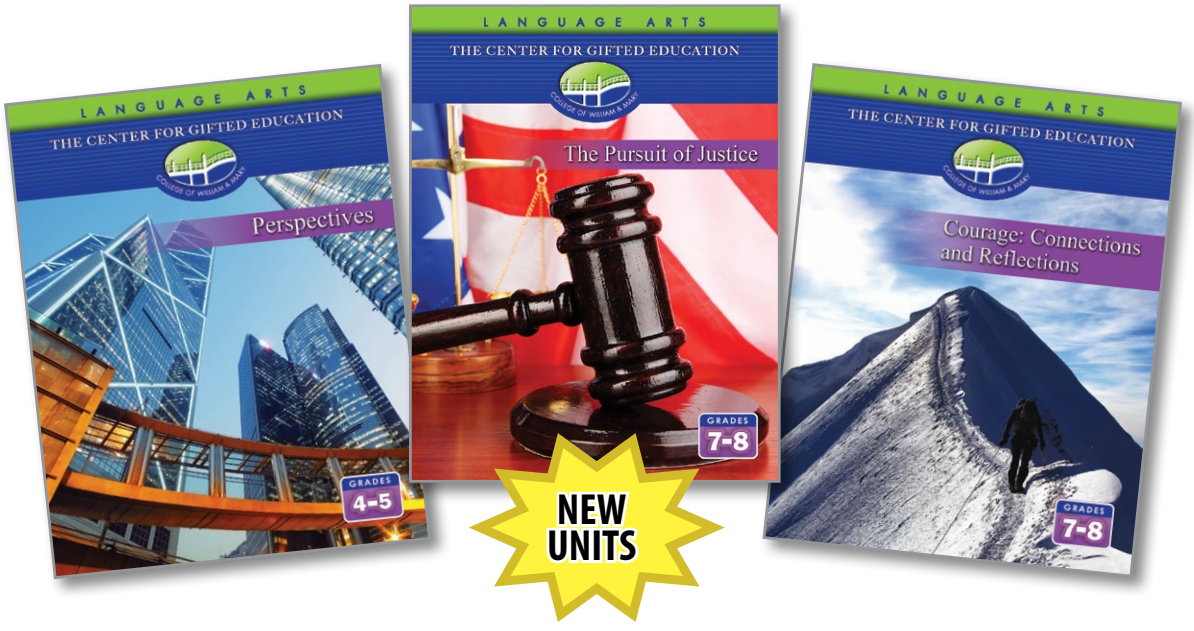
This unit provides an overview of utopia as seen by various individuals, groups, and countries and gives students an opportunity to examine why ideas about utopia undergo change. Through the study of literature, art, music, and other classroom activities, students learn about the search through the ages for utopia and the struggles to grasp and maintain it on both personal and societal levels. Exploring utopia through personal dreams and goals allows students to analyze the literature they read more thoroughly throughout this unit.

Threads of Change in 19th Century American Literature—Grades 8 – 10

This unit uses literature of the 19th century to explore five historical movements: romanticism, transcendentalism, abolitionism, industrialism, and feminism. Each of the five "isms" has its own "literature box" containing appropriate documents to serve as a resource for teams of students. The "isms" are investigated as change agents in American life through the study of key writings of the period.

Change Through Choices—Grades 10 – 12

Choices and the consequences of choices that people make have an important impact on life and the success of individuals. This unit focuses on catalytic choices that determine change in a variety of situations. Rich in content, the world literature chosen can be analyzed and synthesized for depth in understanding cultural similarities and differences. This unit attempts to give the student a chance to question real world choices and problems and decide what valuable lessons can be learned through careful individual examination of options.



Science Curriculum Overview

The William and Mary science curriculum features ambiguous, problem-based learning scenarios. As active investigators, students must take on the role of scientists to solve problems through scientific inquiry. Advanced, in-depth content and a connection to an overarching concept, such as systems, are also emphasized.

Advanced Content

Advanced content is infused within the science curriculum to help students develop expertise in science based on research standards. For example, the National Research Council (2005) has outlined three key practices for developing expertise in science. These are included within the William and Mary science units: 1) address preconceptions and concepts by connecting the content to the outside world and outline appropriate content and understanding; 2) engage students in practice as to what it means to "do" science through inquiry and investigation; and 3) encourage metacognition and reflection through guided teacher feedback, student discussion, and personal reflection.

Unit content has been aligned to national standards and meets national grade level standards as well as standards for grades that are two to three levels above the current grade.

Goals for science units include the following process and concept goals in addition to essential understandings of specific content areas:

1) To understand the concept of systems or change;
2) To understand and apply the basic principles of experimental design and investigation, and
3) To develop reasoning skills with real-world applications to science.

Advanced Process-Product

Problem-based learning is a primary vehicle to help students develop scientific understanding in an in-depth, sophisticated way, by experiencing the processes and tools a scientist may use when presented with a difficult problem.

The William and Mary science units introduce real-world problems to initiate scientific investigation. All units incorporate a problem-based learning scenario as the organizer for discussion of content and scientific investigation.

Students not only focus on specific content learning in science, but they also develop scientific investigation skills as a way to develop the thinking skills of a scientist. Students pose questions, then conduct experiments to answer those questions. They also identify independent and dependent variables, constants, and controls as a guide for quality investigations.

Issues and Themes: Connecting to Concepts

The science units incorporate the overarching concept of systems as a way to link unit components together, add depth to the content, and connect students' learning to essential interdisciplinary understandings.

Examples of systems discussions and applications within the science units include how an acid spill affects the environmental system, how electrical systems impact one another, or how the human body systems are interrelated.

Using these real-world system discussions students learn generalizations about systems and how to identify the inputs, outputs, and interactions among parts, and identify positive and/or dysfunctional systems. Students learn to conceptualize how larger systems can encompass smaller systems, understand the interdependence of systems, and explain how systems exhibit patterns.

Research Findings

Significant and important treatment effects were found for students' ability to plan an experiment after exposure to the William and Mary units.

These students showed significant growth in critical thinking when compared to those students who used the regular science curriculum.

Achievement on performance-based assessments that emphasized higher-order concepts, scientific investigation, and content mastery improved significantly for those students exposed to the units.

Teachers and students both found problem-based science units more engaging than typical science units. Teacher fidelity data suggested that teachers were weak in these areas: content knowledge, the use of flexible grouping strategies, and having students conduct experiments on their own in small groups.

Science Unit Titles

* National Association for Gifted Children's Curriculum Studies Award Winner!

Where's the Beach?—Grades 2-4

Plans for building a children's camp at the beach are on hold because the town council is worried about beach erosion. Since the camp received a large donation to develop nature-themed experiences, designed to teach children how to protect the environment, the camp manager wants to cooperate with the council. The problem is that she must begin construction quickly to be ready for the summer season. Acting as members of the town council, the students must develop scientifically-based regulations that will satisfy the long-term needs of the town and the plans for the new camp.

What A Find!—Grades 2-4 *

What an appropriate title for an exploration of the field of archaeology! Students are put in the role of junior archaeologists at a research museum and discover that construction work has been halted on a new school because historic artifacts were discovered. To determine whether or not the dig is important enough to halt building the school entirely, students learn to excavate and actually conduct the dig—carefully seeded with "historic artifacts."

Acid, Acid Everywhere—Grades 4-6 *

Acid, Acid Everywhere presents the structure of systems through chemistry, ecological habitats, and transportation. This unit poses an ill-structured problem that leads students into an interdisciplinary inquiry about the structure and interaction of several systems, centering around the study of an acid spill on a local highway.

Electricity City—Grades 4-6 *

Electricity City provides a creative and interdisciplinary approach to introducing fourth through sixth grade students to electricity. In this simulated activity, a large recreational complex is being built in the middle of a city, and the students' role is to plan the site's electrical needs, as well as create additional backup plans. This "real world" problem requires students to analyze the situation, determine what type of research is needed, conduct experiments, and evaluate solutions.

Animal Populations—Grades 6-8

This curriculum unit integrates population biology and mathematics. The ill-structured problem puts students in the stakeholder role of assistant to the mayor of a small town in which residents are demanding that something be done about the deer that are eating their landscaped plants. Throughout the unit, students deal with physical models, conceptual models, and mathematical models as they tackle the deer problem and the complication of Lyme Disease.

Nuclear Energy: Friend or Foe?—Grades 6-8

This unit creatively explores the effects of nuclear power waste. The topic is introduced through the eyes of a mayor of a town where a nuclear power plant is located. She must decide if the facility can expand its waste disposal techniques. What are the biological implications of radiation? What are the trade-offs with which society must live as we accept nuclear technologies into our lives? These questions are explored by students as they prepare to make recommendations about the use of the nuclear power plant in their fictitious town.

Something Fishy—Grades 6-8

This unit poses an ill-structured problem that will lead students into an interdisciplinary study about several individual systems and their interactions. The content of the unit focuses on the various systems involved in the pollution of a local body of water: the aquatic ecosystem, chemical reaction systems, government systems, and economic systems. Students are challenged to grapple with real world concerns and develop recommendations through simulation activities based on the scientific process.

No Quick Fix—Grades 6-8

No Quick Fix uses systems as the fundamental concept to help students understand cell and tuberculosis biology. In a series of widening concentric circles, students learn that the cells are elements in larger systems, such as the immune system and the even larger system of the human body. Students also interact with the human social systems: health care and public education. Students take on the role of physician and begin to search for the cause and resolution of the problem. While unraveling the interactions among various systems, students can appreciate the complexities of staying healthy in the modern world.

Social Studies Curriculum Overview

The William and Mary social studies units were designed with the goal of meeting the specific learning needs of the advanced learner, yet also maintaining focus on mainstream learning standards such that they can be used in heterogeneous classrooms.

The major emphases of the units on concept development, critical thinking, and primary source analysis within the context of high-level content reflect the focus of national standards in social studies on historical thinking and research and on the integration of major concepts across disciplines.

The units have been successfully implemented in heterogeneous classrooms and in special classes for the gifted. Foundational principles that are learned in the early units (grades 2-3) are cultivated as students progress to higher grades, maximizing learning potential.

Advanced Content

Unit content has been aligned to national standards and meets grade level standards as well as standards for grades that are two to three levels above the current class grade. Advanced content is also incorporated through the use of primary source documents. Rather than having students read about historical events, the William and Mary social studies units provide learners with primary source documents as learning tools to develop historical perspectives.

When analyzing primary source documents, students establish a context and intent for each piece (author, time written, related culture and events, purpose, intended audience), work to understand the source (issues/events and values reflected in document), and evaluate or interpret the source (reliability, representativeness, potential and actual consequences).

Advanced Process-Product

When students encounter events within curriculum readings, the William and Mary units guide students in analyzing the situation by looking at different points of view. Students may reason through a situation using a graphic organizer to analyze an historical situation or event through multiple stakeholder perspectives. After analyzing a situation, students may be required to take a side or write a persuasive essay from the perspective of one of the stakeholders, thus, incorporating the additional advanced process of articulating the perspectives in a cohesive manner. Persuasive writing opportunities vary by unit content.

Issues and Themes: Connecting to Overarching Concepts

The William and Mary social studies units develop a broad understanding of concepts, such as systems and cause and effect. Students examine relationships to events and eras in history as an essential area of focus. Sample systems discussions include the exploration of the silk trade as a type of economic system, comparison of European colonist and Native American social systems, and comparison of the American political system with that of other democracies. Sample cause and effect discussions are: causes of the American Revolution, effects of the Declaration of Independence, causes of the stock market crash, and effects of the Dust Bowl.

"In the field of gifted education the two decades of curriculum work at William and Mary leads the way in theory, research, and practice. It is rare for one institution to have shown mastery at all of these levels. The Center is a triple crown winner."

—Ann Robinson, Center for Gifted Education,
University of Arkansas at Little Rock
NAGC Vice President

Research Findings

Students engaged in William and Mary social studies units showed significant treatment effects on measures of conceptual thinking, content learning, and critical thinking.

Treatment effects were evident for the whole sample, including nongifted students, and were consistent for males and females. Gifted students showed significant gains in content learning.

Teachers who participated in the project over multiple years demonstrated increased use of strategies related to: accommodating individual differences, general teaching strategies, critical thinking, metacognition, and the use of classroom extensions.

Social Studies Unit Titles

* National Association for Gifted Children's Curriculum Studies Award Winner!

Ancient Egypt: Gift of the Nile—Grades 2-3 *
Gift of the Nile is designed around the idea that human civilizations develop and sustain themselves as a collection of interdependent systems. The civilization of ancient Egypt forms the central content of the unit, with exploration of systems of agriculture, economics, language, and leadership in this ancient culture. Students broaden their understanding by comparing the ancient Egyptian civilization with aspects of their own lives and communities.

Ancient China: The Middle Kingdom—Grades 2-3 *
The concept of systems is the foundation for *The Middle Kingdom*, which explores ancient China to demonstrate the interdependent systems that develop and sustain a civilization. The unit explores systems of agriculture, language, leadership, and trade in ancient China, using models for reasoning and document analysis to support student understanding. This unit may be used in conjunction with *Ancient Egypt*.

Building a New System: Colonial America 1607-1763—Grades 4-5 *
Building a New System begins with an in-depth study of the interrelationships between the Chesapeake Bay system and both the Native Americans and the early English colonists in Virginia. The unit then turns to an exploration of the economic, social, and political systems of early America across the colonies, comparing and contrasting lifestyles of different groups in different regions.

The World Turned Upside Down: The American Revolution—Grades 4-5
Intensive document analysis and exploration of the concept of cause and effect form the foundation of this unit exploring the Revolutionary period in American history. *The World Turned Upside Down* explores the chronology and major events leading up to and during the Revolutionary War and uses primary sources to demonstrate the social and political context.

A House Divided? The Civil War: Its Causes and Effects—Grades 5-6 *
The concept of cause and effect serves as a central organizing theme of *A House Divided?*. This unit explores the events and perspectives leading to the American Civil War and the chronology and context of the war itself. Using primary source documents, students investigate the social, political, and economic influences that were significant in this period of history.

The 1920s in America: A Decade of Tensions—Grades 6-7 *
Centered on a variety of primary sources including music, advertisements, and traditional documents, *The 1920s in America* provides insight into the events, values, lifestyles, and experiences of the 1920s period. Students explore the concept of cause and effect and how it relates to the events of the time, and gain a level of appreciation and understanding as they look at the ways different aspects of the era interact with and influence one another.

The 1930s in America: Facing Depression—Grades 6-7
The 1930s in America explores Depression-era America from the perspective of many different groups of people, utilizing a variety of primary sources to illustrate events and the social-political context. The unit emphasizes the interplay of changes in geography, government, the economy, and the influence of particular individuals and groups.

The Road to the White House: Electing the American President—Grades 6-8
The concept of systems forms the basis for this exploration of American government, and focuses on the processes involved in the election of the President, and the constitutional context of these processes. Students investigate the chronology of campaign and election, and study documents and statistics related to Presidential elections in American history.

Defining Nations—Grades 9-10
This unit is designed around the concepts of nationalism and identity as interrelated ideas that affect events and decisions throughout the world. Unit lessons explore recent changes and conflicts, giving students multiple opportunities to analyze events based on a developing understanding of how the ideas of nationalism and identity apply to specific situations.

The Renaissance and Reformation in Europe—Grades 9-10
This unit focuses on the concept of authority and how the Renaissance and Reformation period was defined by changing notions of political and religious authority. The unit traces the background of the Renaissance and Reformation through exploration of the Mediterranean world in medieval times, then engages students in analysis of various influences on changing conceptions of the church and of political leadership and authority. In addition, the unit explores the cultural changes occurring in the Renaissance and their influence on the past and present. Students engage in extensive primary source analysis and structured reasoning as they explore how political, religious, and economic authority were constituted and legitimized throughout the period.

Primary Sources and Historical Analysis—Grades 9-10
This unit is intended to support students in their development of the skills of the historian, particularly in the area of document analysis. It provides a collection of primary source documents and strategies for engaging students with these documents that will deepen and extend their skills in analyzing and interpreting written historical contributions. The unit lessons may be used as stand-alone pieces as they fit throughout a year's curriculum or addressed as a whole unit on the historical analysis process.

Plan and Organize with Confidence

Unit Teacher Guide — Introduction

Each Teacher Guide begins with an Introduction section that provides helpful information for the teacher prior to teaching the lessons.

Words to the Wise Teacher:

The unit you are about to begin, *Electricity City,* consists of 20 lessons; the unit requires a minimum of 50 hours of instruction. On page 21 is a letter for parents that you may wish to send home with your students or use as a template for your own letter to be distributed before beginning the unit. The letter describes the goals of the curriculum as well as ways parents can supplement the unit at home.

The unit includes many opportunities for students to participate actively in solving a real-world problem. Some of these activities involve homework that supplements class work; others involve research conducted in a library/media center or online. Please read the unit before beginning to teach so that you have a sense of when you might need materials and assistance from your media specialist.

Handouts for the unit are included, as well as some background information on various topics. A separate notebook or Problem Log is required for each student. A materials list at the beginning of each lesson notes specific items for that lesson; however, you may

depending upon the outcomes of sessions w

Several methods for assessing studen

Assessments ask students to demonstrate within the relevant context. Writing activ project, and Problem Log responses thr assessment is included that may be used the end of the unit to their knowledge at th

A section detailing some implementat models of the unit follows the lesson plan this section and, if possible, to attend an units. Contact the Center for Gifted Educa

The Center for Gifted Education thanks yo

4

Letter to the Teacher

The letter to the teacher provides an overview of the unit as well as tips for preparing to teach the unit.

Alignment to National Science Education Standards and Benchmarks for Science Literacy

Category of Standard	*Electricity City*	National Science Education Standards	Benchmarks for Science Literacy
Concept	Students will be able to: 1. Analyze the problem system and electrical systems; 2. Articulate in oral and written form how and why systems work using appropriate systems language such as boundaries, elements, inputs, and outputs; 3. Demonstrate how given systems interact with each other (e.g. both real-world and experimental); 4. Predict the impact of multiple solutions to the given problem within each system; 5. Generalize systems knowledge across problems; 6. Assess how systems change over time based on needs, resources, and circumstances.	A system is an organized group of related objects or components that form a whole. Systems have boundaries, components, resource flow (input and output), and feedback. The goal of this standard is to think and analyze in terms of systems. Prediction is the use of knowledge to identify and explain observations or changes in advance.	Systems: 1. Are something that consist of many parts; the parts usually influence one another. 2. Something may not work as well if a part of it is missing, broken, worn out, mismatched, or misconnected.
Content	Students will be able to: 1. Explore the topic of electricity; 2. Investigate the behavior of electrical circuits and the nature of electricity and its generation; 3. Create and test electrical circuits of their own design; 4. Correctly use terms related to electricity and circuits (AC/DC, resistor, conductor, insulation, and so on); 5. Describe the properties of different circuit elements, including power sources, wires, resistors, and switches; 6. Describe the flow of electricity in a circuit; 7. Read and create simple circuit diagrams; 8. Use circuit elements to build complete electrical circuits with specified properties;	Physical Science: 1. Students will develop the understanding of properties of objects and materials. Science in Personal and Social Perspectives: 2. Students will develop an understanding of science and technology in local challenges.	Nature of Mathematics: 1. Mathematical ideas can be expressed graphically. Technology & Science: 2. Measuring instruments can be used to gather accurate scientific comparisons. Structure of Matter: 3. When a new material is made by combining two or more materials, it has different properties.

continued

Alignment to National Standards

Outlines how the unit aligns with national standards. Available for both science and language arts units.

Electricity City Curriculum Goals

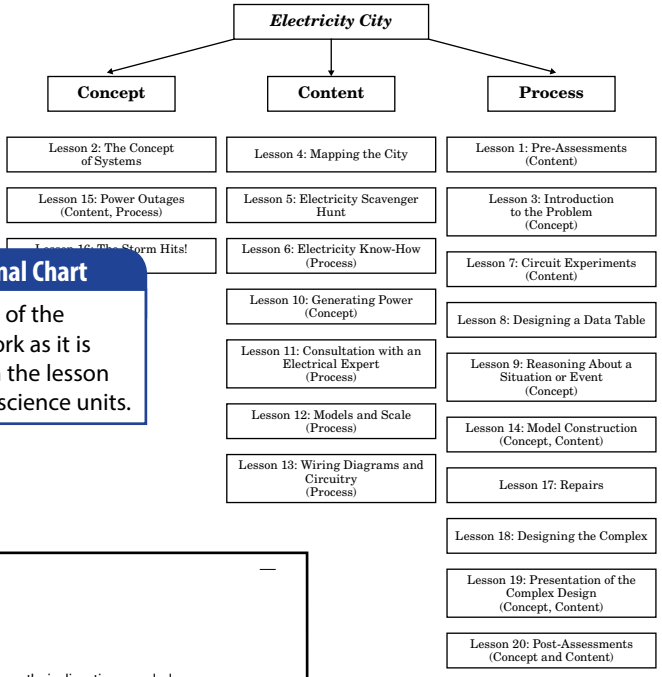
1. Concept	2. Content
Goal 1: To understand the concept of systems	**Goal 2:** To understand the nature and properties of electricity
Curriculum Outcomes	
Students will be able to 1. Analyze the problem system and electrical systems; 2. Articulate in oral and written form how and why systems work using appropriate systems language such as boundaries, elements, inputs, and outputs; 3. Demonstrate how given systems interact with each other (e.g. both real world and experimental); 4. Predict the impact of multiple solutions to the given problem within each system; 5. Generalize systems knowledge across problems; 6. Assess how systems change over time based on needs, resources, and circumstances.	**Students will be able to** 1. Investigate the behavior of electrical circuits and the nature of electricity and its generation; 2. Create and test electrical circuits of their own design; 3. Use terms correctly related to electricity and circuits, specifically AC/DC, resistor, conductor, and insulator; 4. Describe the properties of different circuit elements, including power sources, wires, resistors, and switches; 5. Describe the flow of electricity in a circuit; 6. Read and create simple circuit diagrams; 7. Use circuit elements to build complete electrical circuits with specified properties; 8. Determine whether a circuit is complete or incomplete, either by reading a diagram or by devising a method by which to test the circuit directly; 9. Describe the generation and movement of electricity in an electrical power system from the source to the consumer;
3. Process/Expermental Design	
Goal 3: To understand and apply the principles of basic experimental design	**Goal**
Curriculum Outc	
Students will be able to 1. Design, perform, and report on the results of experiments related to a given problem; 2. Demonstrate good data handling skills; 3. Analyze experimental data as appropriate; 4. Evaluate experimental results; 5. Transfer knowledge to make predictions about similar problems; 6. Articulate enhanced understanding of the scientific area to others.	**Stud**

Curriculum Goals

Lists the goals and related outcomes for students as part of the curriculum framework.

Lesson Organizational Chart

This chart is a graphic depiction of the curriculum framework as it is incorporated within the lesson plans. Each lesson is listed under the heading of the primary type of goal that is covered (concept, content, or process). Secondary goals covered by the lesson plans are listed in parentheses.



Lesson Organizational Chart

A graphic depiction of the curriculum framework as it is incorporated within the lesson plans. Available for science units.

Glossary

Alternating Current (AC) Current in which the electrons reverse their direction regularly

Assumption Conclusions based on one's beliefs and presuppositions

Bias A one-sided or slanted view that may be based on culture, experience, or other aspects of one's background

Blackout Lack of illumination caused by an electrical power failure

Blueprint A drawing or other image, usually with white lines on a blue background, of an architectural plan

Brownout A reduction or cutback in electric power, especially as a result of a sl… a mechanical failure, or overuse by consumers

Boundary Something that indicates a border or limit

Charge Physical property of matter that can give rise to an electric force of attra… repulsion

Circuit Complete path through which electricity can flow

Conductor M…al which pe…lectrons t…

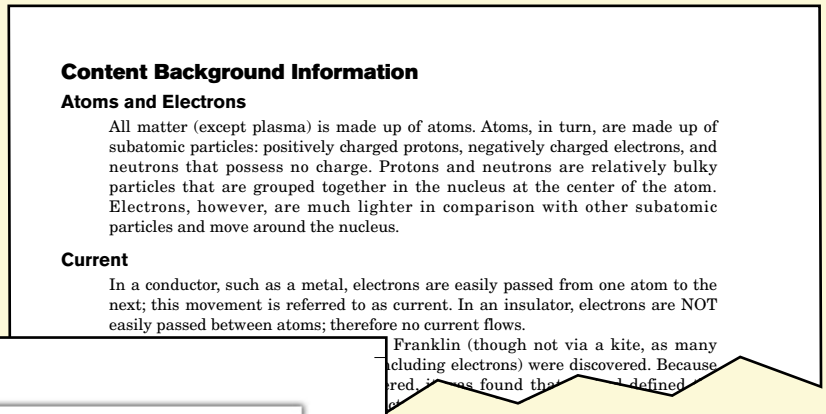
Glossary

A complete listing of unit vocabulary in the form of a glossary available for science and social studies units. A vocabulary list is available for language arts units.

UNIT PLANNING

Content Background Information

Provides background information on content that will be covered within the unit. Available in science units.



Content Background Information

Atoms and Electrons

All matter (except plasma) is made up of atoms. Atoms, in turn, are made up of subatomic particles: positively charged protons, negatively charged electrons, and neutrons that possess no charge. Protons and neutrons are relatively bulky particles that are grouped together in the nucleus at the center of the atom. Electrons, however, are much lighter in comparison with other subatomic particles and move around the nucleus.

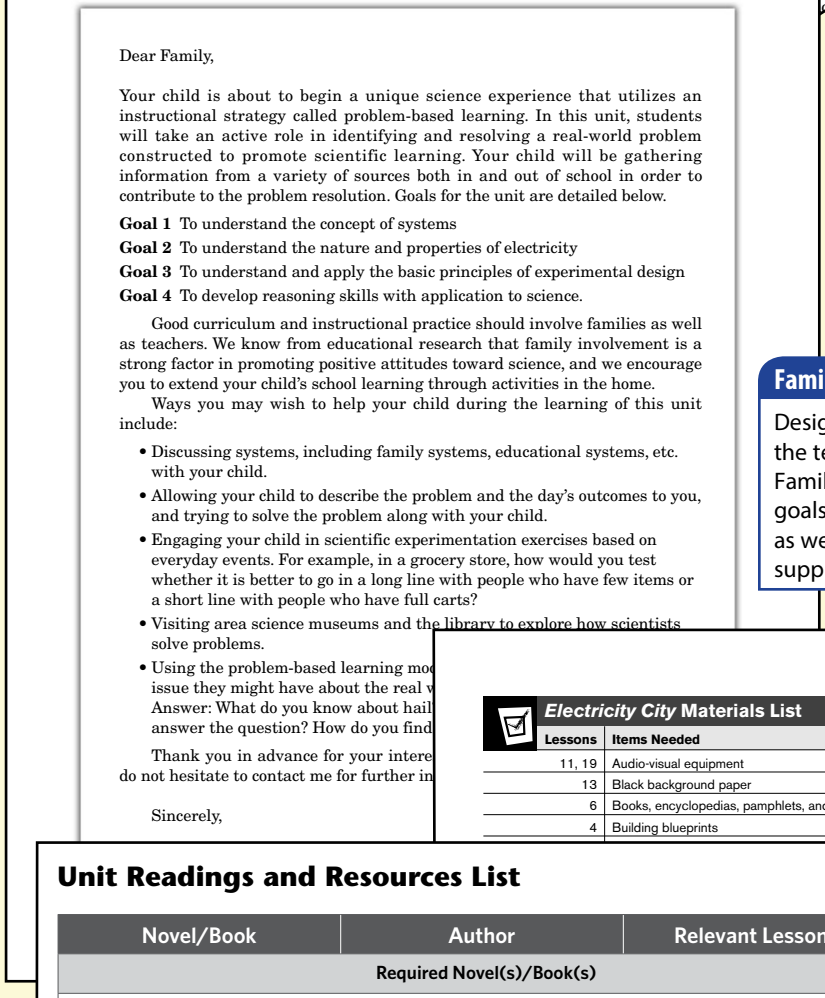
Current

In a conductor, such as a metal, electrons are easily passed from one atom to the next; this movement is referred to as current. In an insulator, electrons are NOT easily passed between atoms; therefore no current flows.

Franklin (though not via a kite, as many
cluding electrons) were discovered. Because
red, it was found that ... defined

Family Letter

Designed to go out under the teacher's signature, the Family Letter describes the goals of the curriculum unit as well as ways parents can supplement the unit at home.



Dear Family,

Your child is about to begin a unique science experience that utilizes an instructional strategy called problem-based learning. In this unit, students will take an active role in identifying and resolving a real-world problem constructed to promote scientific learning. Your child will be gathering information from a variety of sources both in and out of school in order to contribute to the problem resolution. Goals for the unit are detailed below.

Goal 1 To understand the concept of systems
Goal 2 To understand the nature and properties of electricity
Goal 3 To understand and apply the basic principles of experimental design
Goal 4 To develop reasoning skills with application to science.

Good curriculum and instructional practice should involve families as well as teachers. We know from educational research that family involvement is a strong factor in promoting positive attitudes toward science, and we encourage you to extend your child's school learning through activities in the home.

Ways you may wish to help your child during the learning of this unit include:

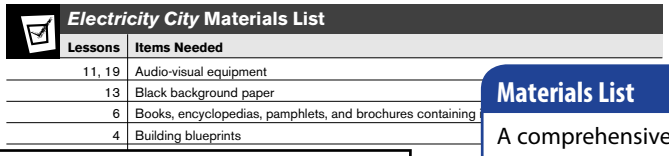
- Discussing systems, including family systems, educational systems, etc. with your child.
- Allowing your child to describe the problem and the day's outcomes to you, and trying to solve the problem along with your child.
- Engaging your child in scientific experimentation exercises based on everyday events. For example, in a grocery store, how would you test whether it is better to go in a long line with people who have few items or a short line with people who have full carts?
- Visiting area science museums and the library to explore how scientists solve problems.
- Using the problem-based learning mo
issue they might have about the real w
Answer: What do you know about hail
answer the question? How do you find

Thank you in advance for your intere
do not hesitate to contact me for further in

Sincerely,

Materials List

A comprehensive list of materials needed for the unit and corresponding lessons. Available for science units.

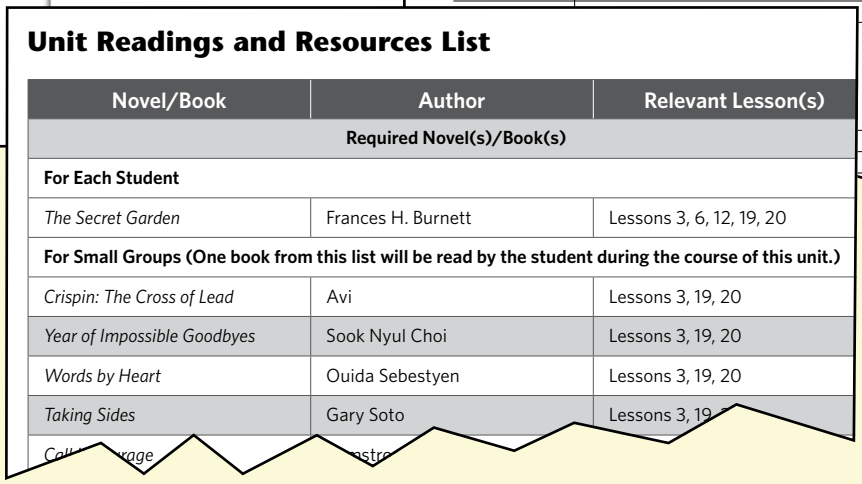


Electricity City Materials List

Lessons	Items Needed
11, 19	Audio-visual equipment
13	Black background paper
6	Books, encyclopedias, pamphlets, and brochures containing
4	Building blueprints

Literature List

A listing of the literature for the unit. Available for language arts units.



Unit Readings and Resources List

Novel/Book	Author	Relevant Lesson(s)
Required Novel(s)/Book(s)		
For Each Student		
The Secret Garden	Frances H. Burnett	Lessons 3, 6, 12, 19, 20
For Small Groups (One book from this list will be read by the student during the course of this unit.)		
Crispin: The Cross of Lead	Avi	Lessons 3, 19, 20
Year of Impossible Goodbyes	Sook Nyul Choi	Lessons 3, 19, 20
Words by Heart	Ouida Sebestyen	Lessons 3, 19, 20
Taking Sides	Gary Soto	Lessons 3, 19
Call ... rage	...nstro	

Teaching the Lesson

Unit Teacher Guide — Lesson

Includes detailed instructions for teaching the lesson.

Curriculum Alignment Code

Lesson 13	GOAL 1	GOAL 2	GOAL 3	GOAL 4	GOAL 5	GOAL 6
	X	X	X		X	X

A Japanese Folktale

Curriculum Alignment

Represents the goals covered within the lesson.

Instructional Purpose

- To develop research process skills.
- To analyze and interpret a selected story.
- To revise student writing.

Materials Used

1. "The Old Man and His Affectionate Son"
2. Student response journals
3. Developing an Issue (Student Activity Page 13A)
4. Literature Web (Student Activity Page 13B)
5. Sample Literature Web (Teacher Resource Page13A)
6. Unit Change Matrix
7. Nonfiction resource materials about Japan
8. Vocabulary Web (Student Activity Page 13C)
9. Student writing assignments from lesson 12
10. Self-Review of Writing (Student Activity Page 13D)
11. Peer Review of Writing (Student Activity Page 13E)
12. Teacher Review of Writing (Teacher Resource Page 13B)

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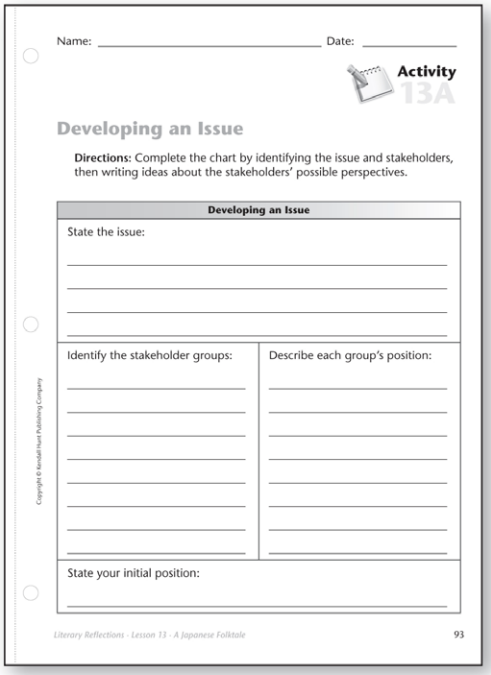
Activities

1. Divide students into small groups. Discuss the meaning of the term *dilemma* and ask students for examples of dilemmas they have faced in their lives. Present the following scenario for students to consider:

A society does not have enough resources to feed all of its people. re is a proposal to take all people the age of seventy into the ntains and let them fend for nselves.

Activities

Describes teacher and student activities in the lesson.



Name: _____ Date: _____

Activity 13A

Developing an Issue

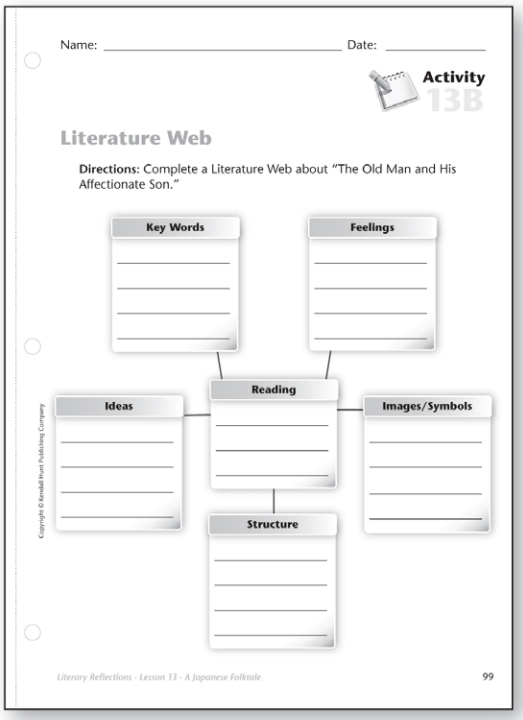
Directions: Complete the chart by identifying the issue and stakeholders, then writing ideas about the stakeholders' possible perspectives.

Developing an Issue	
State the issue:	
Identify the stakeholder groups:	Describe each group's position:
State your initial position:	

Literary Reflections · Lesson 13 · A Japanese Folktale 93

From Student Guide, page 93

2. Give each group a copy of the Developing an Issue chart (Student Activity Page 13A). Have students complete the chart by identifying the issue and stakeholders, then writing ideas about the stakeholders' possible perspectives. As a class, discuss the implications of proposed decisions.



Name: _____ Date: _____

Activity 13B

Literature Web

Directions: Complete a Literature Web about "The Old Man and His Affectionate Son."

Key Words | Feelings | Reading | Ideas | Images/Symbols | Structure

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From Student Guide, page 99

3. Have students read silently the Japanese folktale "The Old Man and His Affectionate Son." Students should then complete individual Literature Webs (Student Activity Page 13B) about the story. Then have students return to their small groups to share their responses.

4. A Sample Literature Web (Teacher Resource 13A) is provided as an example to illustrate the types of responses that students may give. Because the literature web is intended to elicit students' individual responses to texts, it is essential that these examples be used merely as a guide; variations and original thought should be valued and rewarded. Students should be encouraged to provide evidence from the text to support any response.

5. Continue the discussion, using the following questions as a guide.

Literary Analysis and Interpretation Questions

- Why did the son decide to disobey the law?
- What adjectives would you use to describe the son? How would you describe the old man? What about the lord?
- Was the lord of the land a good leader? Why or why not? What characteristics make a person a good leader?
- Why do you think the lord of the land asked such difficult questions of his people? What might he have been trying to find out?

Reasoning Questions

- What is the central dilemma in the story? What are the implications for the old people of being taken to the mountains? What are the implications for everyone else?
- What assumptions about old people did the lord of the land hold?
- In what ways is the concept of love important in this story?
- What might have been the purpose for telling this story? What kinds of attitudes toward elderly people does the story support?

Change Questions

- What important change related to time is shown in this story? In what ways do people change over time? Are these changes positive or negative?
- How did the son's personal feelings for his father bring about a change for his whole society?

6. Have students develop a concept map for the idea of wisdom based on this story. To help them get started, suggest that they consider the characters in the story and how each was wise or unwise.

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Assessment

Outlines the options for assessment. Available for science units.

Assessment

- Student-drawn maps of the school and electrical features: Assess maps for accuracy and the inclusion of required elements.
- **Problem Log Questions:** Evaluate student metacognitive skills regarding their changing perceptions of the problems.

Technology Integration

- Have students explore websites dealing with electrical safety. Some appropriate sites are:
  - Electric Avenue: http://www.firstenergycorp.com/kids/index.html
  - Electric Universe: http://csu.electricuniverse.com/[illegible]/index.html
  - [illegible]nkenst[illegible] Ligh[illegible]

Technology Integration

Lists opportunities to integrate technology into the lesson. Available for science units.

Note

Provides additional information and teaching tips for the instructor.

[illegible]ry.

- To revise student writing.

Materials Used

1. "The Old Man and His Affectionate Son"
2. Student response journals
3. Developing an Issue (Student Activity Page 13A)
4. Literature Web (Student Activity Page 13B)
5. Sample Literature Web (Teacher Resource Page13A)
6. Unit Change Matrix
7. Nonfiction resource materials about Japan
8. Vocabulary Web (Student Activity Page 13C)
9. Student writing assignments from lesson 12
10. Self-Review of Writing (Student Activity Page 13D)
11. Peer Review of Writing (Student Activity Page 13E)
12. Teacher Review of Writing (Teacher Resource [illegible]

Homework

Describes the homework assignment, which can be assigned for reinforcement of unit skills or for enrichment purposes.

Name: _____ Date: _____

Activity 13A

[illegible] and stakeholders, [illegible]spectives.

Developing an Issue

State the issue:

Identify the stakeholder groups:	Describe each group's position:

State your initial position:

Literary Reflections · Lesson 13 · A Japanese Folktale 93

From Student Guide, page 93

Extensions

Additional activities to reinforce comprehension.

[illegible]ities

1. Divide students into small groups. Discuss the meaning of the term *dilemma* and ask students for examples of dilemmas they have [illegible]

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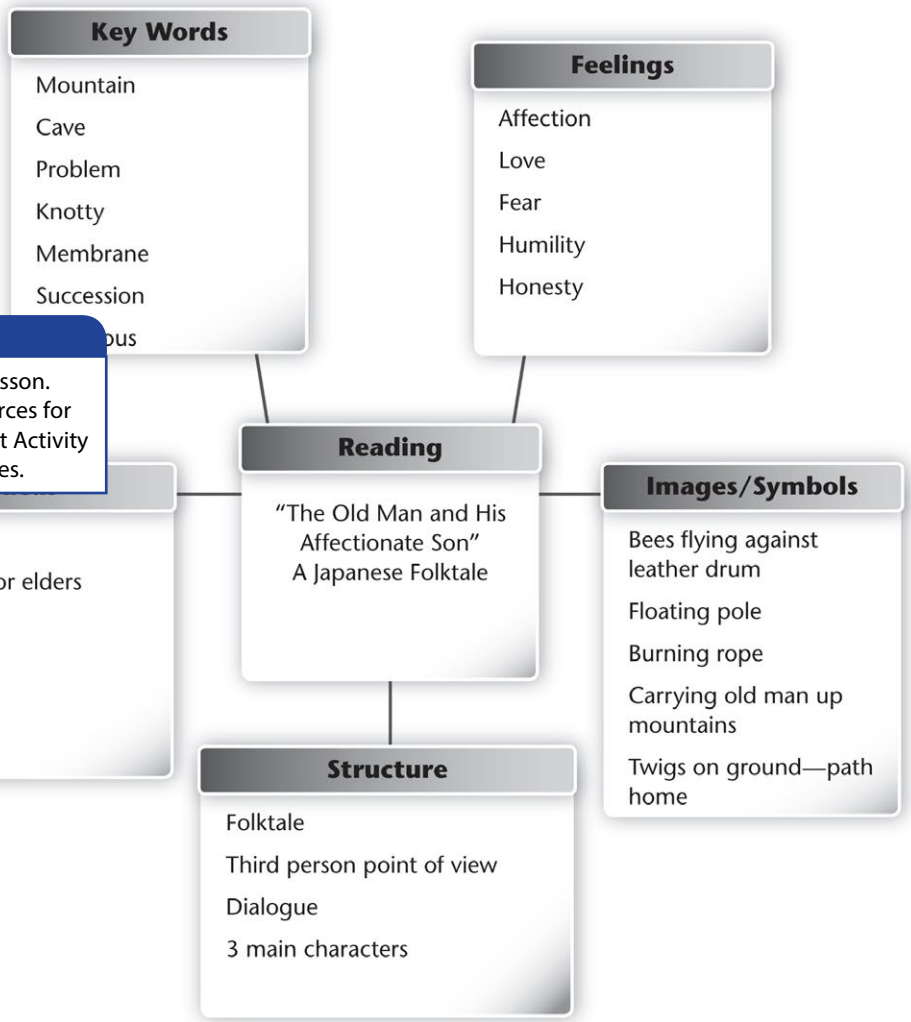
Sample Literature Web for "The Old Man and His Affectionate Son"

13A



Teacher Resource Page

Included as part of each lesson. They serve as useful resources for the corresponding Student Activity Pages in the Student Guides.

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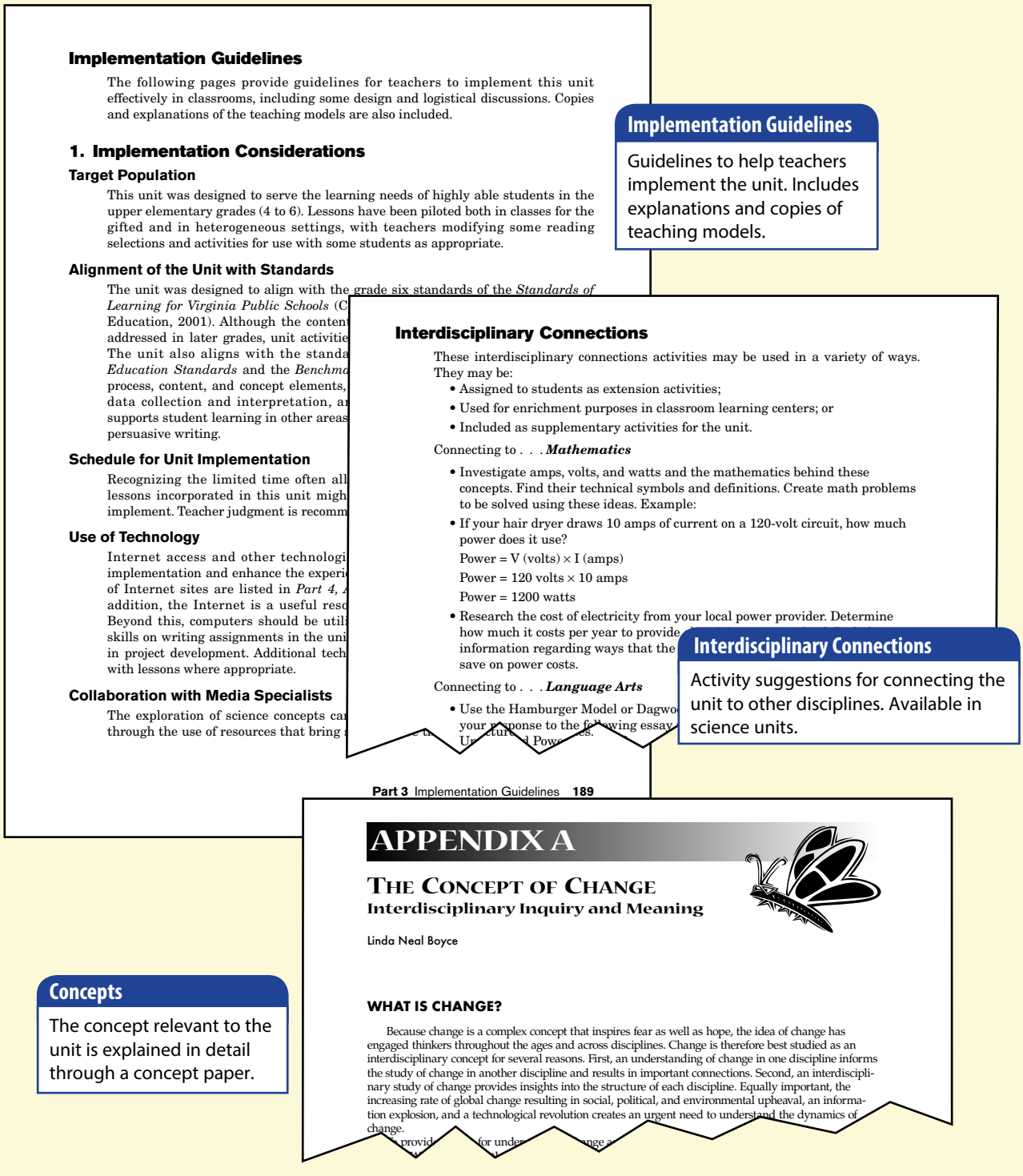
Resources

Unit Teacher Guide — Resources

Additional resources can be found within each Unit Teacher Guide, including: Implementation Guidelines, Appendices (available in science units: Concept Paper, Suggested Mini-Lessons, Interdisciplinary Connections, Suggested Rubrics), as well as References and Resources, and an Index.



Implementation Guidelines

The following pages provide guidelines for teachers to implement this unit effectively in classrooms, including some design and logistical discussions. Copies and explanations of the teaching models are also included.

1. Implementation Considerations

Target Population

This unit was designed to serve the learning needs of highly able students in the upper elementary grades (4 to 6). Lessons have been piloted both in classes for the gifted and in heterogeneous settings, with teachers modifying some reading selections and activities for use with some students as appropriate.

Alignment of the Unit with Standards

The unit was designed to align with the grade six standards of the *Standards of Learning for Virginia Public Schools* (C Education, 2001). Although the content addressed in later grades, unit activitie The unit also aligns with the standa *Education Standards* and the *Benchma* process, content, and concept elements, data collection and interpretation, a supports student learning in other areas persuasive writing.

Schedule for Unit Implementation

Recognizing the limited time often all lessons incorporated in this unit migh implement. Teacher judgment is recomm

Use of Technology

Internet access and other technologi implementation and enhance the experi of Internet sites are listed in *Part 4, A* addition, the Internet is a useful reso Beyond this, computers should be utili skills on writing assignments in the uni in project development. Additional tech with lessons where appropriate.

Collaboration with Media Specialists

The exploration of science concepts ca through the use of resources that bring

Interdisciplinary Connections

These interdisciplinary connections activities may be used in a variety of ways. They may be:

- Assigned to students as extension activities;
- Used for enrichment purposes in classroom learning centers; or
- Included as supplementary activities for the unit.

Connecting to . . . ***Mathematics***

- Investigate amps, volts, and watts and the mathematics behind these concepts. Find their technical symbols and definitions. Create math problems to be solved using these ideas. Example:
- If your hair dryer draws 10 amps of current on a 120-volt circuit, how much power does it use?

  Power = V (volts) × I (amps)

  Power = 120 volts × 10 amps

  Power = 1200 watts
- Research the cost of electricity from your local power provider. Determine how much it costs per year to provide information regarding ways that the save on power costs.

Connecting to . . . ***Language Arts***

- Use the Hamburger Model or Dagwo your response to the following essay Unstructured Powe

Part 3 Implementation Guidelines **189**

Implementation Guidelines

Guidelines to help teachers implement the unit. Includes explanations and copies of teaching models.

Interdisciplinary Connections

Activity suggestions for connecting the unit to other disciplines. Available in science units.

APPENDIX A

THE CONCEPT OF CHANGE

Interdisciplinary Inquiry and Meaning

Linda Neal Boyce

WHAT IS CHANGE?

Because change is a complex concept that inspires fear as well as hope, the idea of change has engaged thinkers throughout the ages and across disciplines. Change is therefore best studied as an interdisciplinary concept for several reasons. First, an understanding of change in one discipline informs the study of change in another discipline and results in important connections. Second, an interdisciplinary study of change provides insights into the structure of each discipline. Equally important, the increasing rate of global change resulting in social, political, and environmental upheaval, an information explosion, and a technological revolution creates an urgent need to understand the dynamics of change.

provid for under nge a

Concepts

The concept relevant to the unit is explained in detail through a concept paper.

Multiple Assessment Options

The Center for Gifted Education curriculum units contain many assessment features that can be used to monitor student progress and assess learning.

Formative Assessment

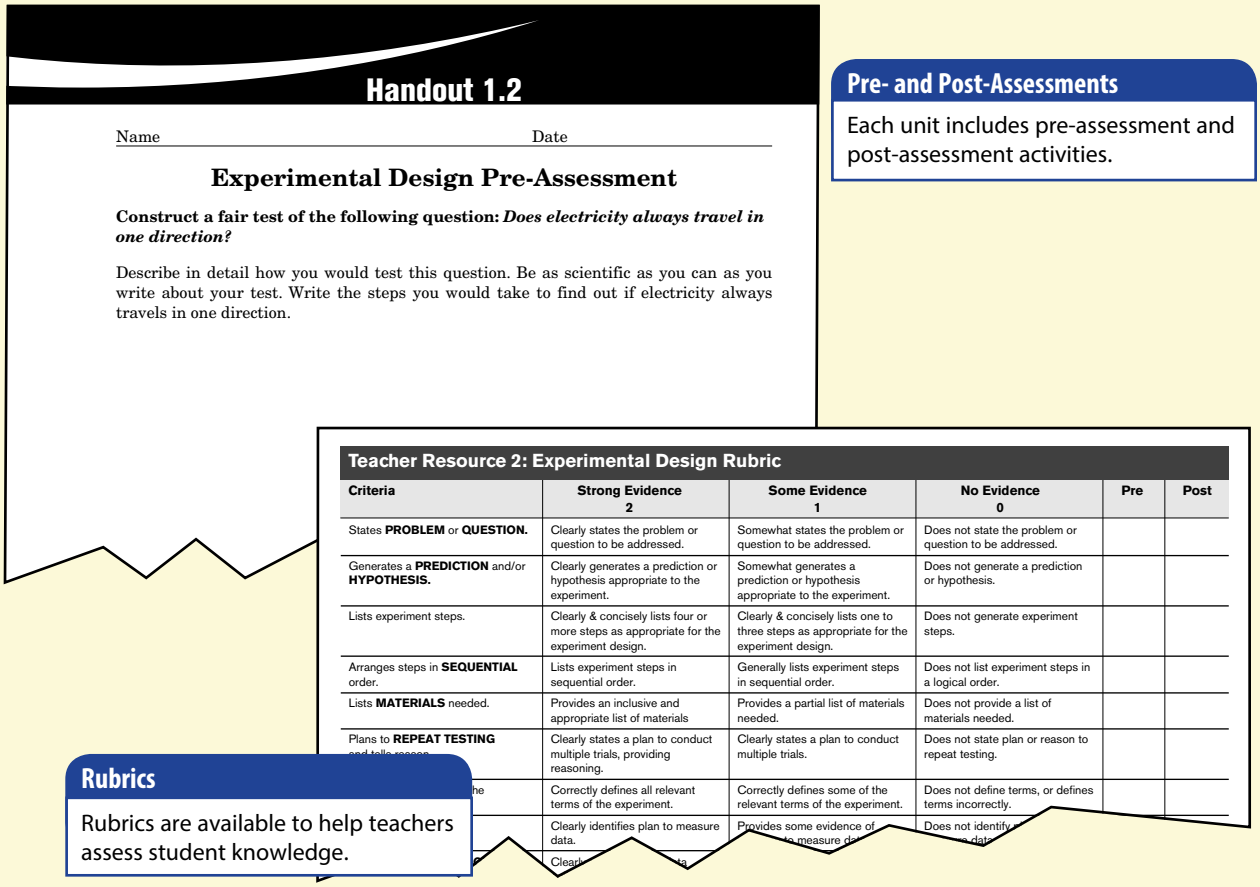
Opportunities for formative assessment include:

- Student Problem Logs (science) that are a written compilation of the student's thoughts about problems.
- Observation by the teacher of student participation in large- and small-group activities.
- Completed Teaching Models (graphic organizers) that reflect student understanding of lesson skills and concepts.

Summative Assessment

Opportunities for summative assessment include:

- Post-assessments that allow the teacher to determine whether individual students have met the unit objectives.
- Rubrics that are included for assessing student work.
- A research project (language arts and social studies) that is the culminating activity for the unit.



Handout 1.2

Name Date

Experimental Design Pre-Assessment

Construct a fair test of the following question: *Does electricity always travel in one direction?*

Describe in detail how you would test this question. Be as scientific as you can as you write about your test. Write the steps you would take to find out if electricity always travels in one direction.

Teacher Resource 2: Experimental Design Rubric

Criteria	Strong Evidence 2	Some Evidence 1	No Evidence 0	Pre	Post
States **PROBLEM** or **QUESTION.**	Clearly states the problem or question to be addressed.	Somewhat states the problem or question to be addressed.	Does not state the problem or question to be addressed.		
Generates a **PREDICTION** and/or **HYPOTHESIS.**	Clearly generates a prediction or hypothesis appropriate to the experiment.	Somewhat generates a prediction or hypothesis appropriate to the experiment.	Does not generate a prediction or hypothesis.		
Lists experiment steps.	Clearly & concisely lists four or more steps as appropriate for the experiment design.	Clearly & concisely lists one to three steps as appropriate for the experiment design.	Does not generate experiment steps.		
Arranges steps in **SEQUENTIAL** order.	Lists experiment steps in sequential order.	Generally lists experiment steps in sequential order.	Does not list experiment steps in a logical order.		
Lists **MATERIALS** needed.	Provides an inclusive and appropriate list of materials	Provides a partial list of materials needed.	Does not provide a list of materials needed.		
Plans to **REPEAT TESTING**	Clearly states a plan to conduct multiple trials, providing reasoning.	Clearly states a plan to conduct multiple trials.	Does not state plan or reason to repeat testing.		
	Correctly defines all relevant terms of the experiment.	Correctly defines some of the relevant terms of the experiment.	Does not define terms, or defines terms incorrectly.		
	Clearly identifies plan to measure data.	Provides some evidence of	Does not identify		
	Clearly				

Pre- and Post-Assessments

Each unit includes pre-assessment and post-assessment activities.

Rubrics

Rubrics are available to help teachers assess student knowledge.

Handout 20.1

Name _____ Date _____

Content Post-Assessment (45 minutes)

1. Suppose you had the experimental setup diagrammed below, in which one end of a wire is connected to
   connected to the bas
   the light bulb to the

   a. Is the circuit in th
   circuit? How do y

Scoring Guide

Scoring guides help teachers in assessing student knowledge.

Content Post-Assessment Scoring Guide
(Teacher Resource 1)

1. **(15 point total)** Suppose you had the experimental setup diagrammed below, in which one end of a wire is connected to the positive terminal of a battery and the other end is connected to the base of a small light bulb; a second wire runs from the base of the light bulb to the battery's negative terminal; and the light bulb is shining.

   a. **(5 points)** Is the circuit in the experimental setup a complete circuit or an incomplete circuit? How do you know?

The circuit is complete, because the light bulb shines due to the charge in the battery; if it were incomplete, the light bulb would stay off.

Scoring: Giv points for

Handout 4.1

Name _____ Date _____

Problem Log Questions

1. Looking at problems from different perspectives often brings new ideas, information or situations to light. What did working on the map and/or blueprint reveal to you? Did the problem change at all in your mind? How

2. Think about the process
   three most important pie
   maker? Explain your cho

Student Problem Logs

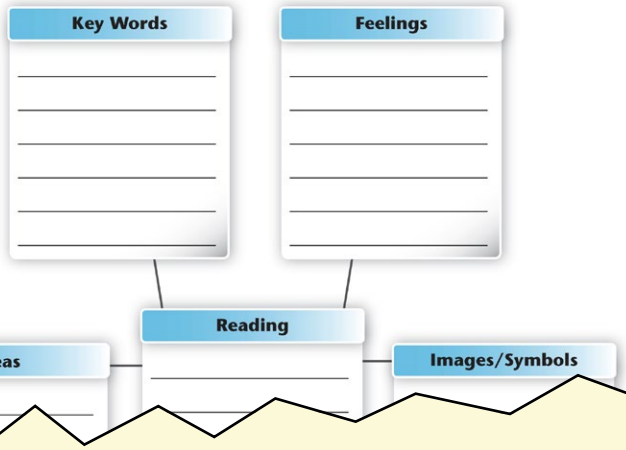
Student Problem Logs give students an opportunity to write down their thoughts about problems. Available in science units.

Name: _____ Date: _____

Activity 7A

Literature Web

Directions: Complete a literature web about the poem assigned to you.



Models

Teaching models can be completed by students and used for assessment purposes.

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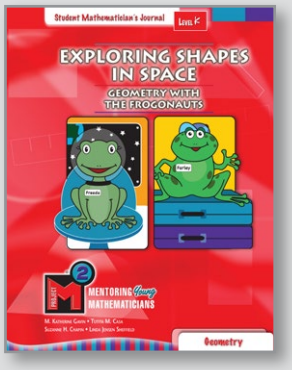

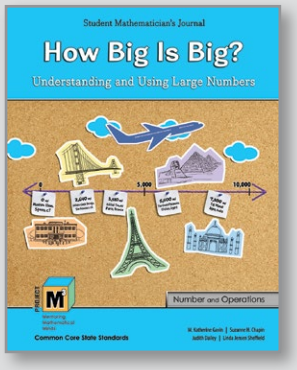

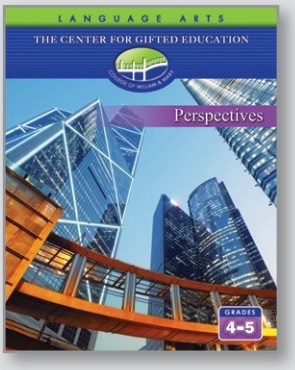

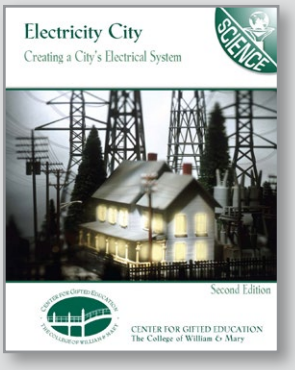

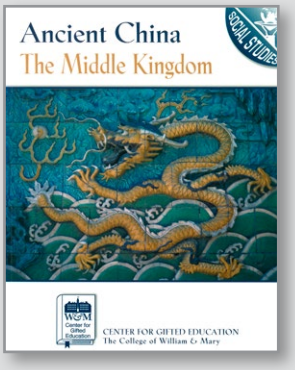

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To obtain a program sample that's right for you, visit **kendallhunt.com/tellmemore.**

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