Grade 7 Social Studies
Module 2

World History and Geography:
The Renaissance and the Age of Exploration

Module Goal

The goal of this module is to provide information that will help educators increase their knowledge of grade-appropriate social studies concepts, knowledge, and skills to support effective planning or modification of their existing social studies instructional units for students with significant cognitive disabilities. The module includes important concepts, knowledge, and skills for the following instructional units:

- The Renaissance
- The Age of Exploration

Module Objectives

The content module supports educators' planning and implementation of instructional units in social studies by:

- Developing an understanding of the concepts and vocabulary that interconnect with information in the module units.
- Learning instructional strategies that support teaching students the concepts, knowledge, and skills related to the module units.
- Discovering ways to transfer and generalize the content, knowledge, and skills to future school, community, and work environments.

The module provides an overview of the social studies concepts, content, and vocabulary related to World History and Geography: The Renaissance and the Age of Exploration and provides suggested teaching strategies and ways to support transference and generalization of the concepts, knowledge, and skills. The module does not include lesson plans and is not a comprehensive instructional unit. Rather, the module provides information for educators to use when developing instructional units and lesson plans.

The module organizes the information using the following sections:

I. Social Studies Academic Standards and Related Alternate Assessment Targets and Underlying Concepts;
II. Connecting Concepts;
III. Vocabulary and Background Knowledge information, including ideas to teach vocabulary;
IV. Overview of Units' Content;
V. Universal Design for Learning (UDL) Suggestions;
VI. Transfer and Generalize Concepts, Knowledge, and Skills;
VII. Concepts and Vocabulary Multi-Age Planning: Grades six through eight; and
VIII. Tactile Maps and Graphics.

Section I

Social Studies Academic Standards and Related Alternate Assessment Targets and Underlying Concepts

It is important to know the expectations for each unit when planning for instruction. The first step in the planning process is to become familiar with the identified academic standards and related Alternate Assessment Targets (AATs) and Underlying Concepts (UCs) covered in the module. The AATs are specific statements of knowledge and skills linked to the grade-specific social studies academic standards. The UCs are basic key ideas or concepts linked to specific AATs. UCs are a basis for developing a more

complex understanding of the knowledge and skills represented in the AAT and should not be taught in isolation. It is important to provide instruction on the AAT along with the UC in order to move toward acquisition of the same concepts, knowledge, and skills.

Table 1 includes the grade 7 academic standards and related AATs and UCs addressed by this module and organizes them by the units of study. While only the academic standards targeted for the Tennessee Comprehensive Assessment Program/Alternate (TCAP/Alt) are included, instruction on additional standards will aid in student understanding. Standards that are not included still represent important content for students to master. Therefore, the AATs and UCs included in the table do not cover all of the concepts that can be taught to support progress and understanding aligned to the standards.

The Tennessee Social Studies Academic Standards include the following codes

C – Civics
E – Economics
G – Geography

H – History
P – People
TN – Tennessee

Table 1. Social Studies Academic Standards and Related AATs and UCs [1]

Academic Standards	Alternate Assessment Targets (AAT)	Underlying Concepts (UC)
The Renaissance		
7.45 Summarize the effects and implications of the reopening of the ancient Silk Road between Europe and China, including Marco Polo's travels and the location of his routes. (CEGH)	Explain how the travels of Marco Polo contributed to the growth of European trade.	Identify a reason why trade is important to groups of people.
7.48 Outline the advances made in literature, the arts, science, mathematics, cartography, engineering, and the understanding of human anatomy and astronomy, including Leonardo da Vinci (Last Supper, Mona Lisa), Michelangelo (the Sistine Chapel, the statue of David), Johann Gutenberg, and William Shakespeare. (CHG)	Identify how advances in science, mathematics or map building helped people during the Renaissance.	Identify a reason why learning new things is important.
The Age of Exploration		
7.71 Identify the European countries responsible for North American exploration and the modern-day countries in which they settled, including France,	Identify reasons why European countries were successful in colonizing in North America.	Identify countries that colonized North America.

Academic Standards	Alternate Assessment Targets (AAT)	Underlying Concepts (UC)
Spain, England, Portugal, and the Dutch. Summarize the reasons for the success of these countries in colonization of North and South America.). (EGHP)		
7.74 Examine the impact of the exchanges of plants, animals, technology, culture, ideas, and diseases among Europe, Africa, Asia, and the Americas in the 15th and 16th centuries and the major economic and social effects on each continent. (CEGH)	Identify an effect of the exchange of products (e.g., potatoes, tomatoes, or corn) between the Americas and the world.	Identify important agricultural products (e.g., potatoes, tomatoes, or corn) exchanged between people living in different places.

[1] Instruction is not intended to be limited to the concepts, knowledge, and skills represented by the AATs and UCs listed in Table 1.

Section II

Connecting Concepts

Grade-level social studies content includes Connecting Concepts, concepts that connect information between different people, places, events, and time periods. Helping students make connections between these types of concepts and new content information supports comprehension of the concepts, knowledge, and skills as well as transference and generalization (see Section VI for more information). Connecting Concepts that are specific to this module connect to content across the units within the module as well as across modules and across grades.

A Connecting Concept is a common link between multiple standards and units of study. The Connecting Concepts, by being revisited and linked to multiple units of study, become a strong foundation of understanding and support the students in learning new concepts. For example, understanding the effect of exchanging goods on people living in different places (e.g., new products, ideas, cultures) is a Connecting Concept that applies to the trading centers of Timbuktu and Jenne, trade during the Song Dynasties, trade resulting from travel on the Silk Road, and exchanges during the Renaissance and the Age of Exploration. Some Connecting Concepts may apply across multiple content areas and instructional emphases (e.g., studying famous Renaissance artists and their works).

Teaching Connecting Concepts
The following strategies pulled from the principles of UDL (CAST, 2011) are ways in which to teach Connecting Concepts to help students understand the concepts and make connections between different curricular content. During instruction, highlight:
- patterns (e.g., Sharing how geography affected where people lived, traded, and traveled in the past as compared to these aspects of life for people in modern times.),

- critical features (e.g., Emphasize the importance of trading/exchanging goods and services.),
- big ideas (e.g., Learning helps societies grow and advance.), and
- relationships (e.g., Make connections between new technologies and new ways of accomplishing tasks such as printing books.).

For example, when learning about advances made during the Renaissance, compare how Gutenberg's moveable type printing press increased production of books and thus changed people's access to books and learning. In addition, build connections between familiar and new information (e.g., Show the connection between the types of technology used to trade across the ocean by describing the sailing ships used during the Age of Exploration and the cargo ships or freighters used in modern times.).

Following are **Connecting Concepts** for this Content Module — World History and Geography: The Renaissance and the Age of Exploration.

Understand:

- basic economics
- types of goods and services
- how geography affects a region's economy
- the effect of exchanging goods on people living in different places (e.g., new products, diseases, etc.)
- the importance of trading/exchanging goods and services
- how goods and services are exchanged
- types of economies and the effects of change in an economy (e.g., jobs, where people live, what they spend money on, etc.)
- how natural resources affect a community
- benefits, reasons, and ways groups cooperate
- how to think spatially and use a variety of maps and map tools (e.g., compass rose, legend)
- how to interpret physical and political features on a variety of maps

- how geography and climate affect exploration
- how geography affects where people live, trade, and travel
- how geography affects growth of a society
- the importance of explorers and land and sea routes on trade, migration, and colonization
- reasons people move to and/or leave places
- the effect of new developments, technology, and inventions and their improvements on people's lives in the past and present
- the relationship between learning and growth/advancement of societies and cities
- how people and places can affect learning, art, architecture, and literature
- how learning, art, architecture, and literature affect people's lives
- reasons for successful exploration and colonization

Connecting Concept Resources[1] :

Grant Wiggins talks about "big ideas" in this article.
http://www.authenticeducation.org/ae_bigideas/article.lasso?artid=99

This site provides examples and printable versions of graphic organizers for social studies that can be modified to meet the students' needs.
https://walch.com/samplepages/050078.pdf

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[1] The resources in this module may change over time and no longer be available.

Teaching History has a video explaining historical thinking to teachers and how to adapt documents for the classroom.

- http://teachinghistory.org/historical-thinking-intro
- http://teachinghistory.org/teaching-materials/teaching-guides/23560

Education Resources Information Center provides a story and activity, Gram's Trunk, that motivate students to investigate history (grades K-8). http://eric.ed.gov/?id=ED466415

The American Historical Association shares the "five C's of historical thinking." https://www.historians.org/publications-and-directories/perspectives-on-history/january-2007/what-does-it-mean-to-think-historically

Section III

Vocabulary and Background Knowledge

Vocabulary is critical to building an understanding of social studies concepts, knowledge, and skills. The vocabulary words that students gain through experiences provide ways for students to comprehend new information (Sprenger, 2013). Students can better understand new vocabulary when they have some background knowledge to which they can make connections. In addition, learning new vocabulary increases students' background knowledge. Therefore, it is important to teach vocabulary purposely when introducing new concepts, knowledge, or skills (e.g., the Renaissance) and in the context of the specific content (e.g., Teach the terms silk, gold, and compass in the context of trade on the Silk Road.).

This module includes two types of vocabulary words, both equally important to teach. The first type, **general vocabulary words,** labels groups of words that address different people, places, events, and time periods. For example, understanding the meaning of the word "cartography" helps students to connect the use of maps currently and historically. The second type of vocabulary words, **specific content words,** represent groups of words that address a specific person, group of people, place, event, or time period. Specific content words are typically proper nouns, such as Michelangelo, and connect to general words (e.g., painting and sculpture). Providing instruction on general words provides background knowledge when introducing corresponding or related specific words.

Key Vocabulary for Instructional Units

Table 2 and Table 3 contain lists of key general vocabulary words and specific content words that are important to the units in this module. Each general vocabulary word should be taught to the student using a student-friendly description of what the word means, an example of the word, and a historical example.

Teach the specific content vocabulary using a student-friendly description of the word meaning and a possible connection to a general vocabulary word. Do not teach memorization of vocabulary words; instead place emphasis on understanding the word. For example, a student should be able to give an example of a domesticated animal vs. defining the word "domesticate."

Table 2. General Vocabulary Words

General Vocabulary – words that generalize to different people, places, events, and time periods.

Describe the words and provide examples (e.g., architecture – designing buildings. *Example: The United States Capitol Building is an example of architecture.).*

• agriculture	• education	• poetry
• anatomy	• engineering	• printing press
• architecture	• exchange	• product
• art	• explorer	• route
• astronomy	• gold	• rulers
• capitalism	• goods	• sail
• cartography/map building	• ideas	• science/scientists
• colony	• knowledge	• settle
• colonize	• mathematics/mathematicians	• silk
• compass	• mercantilism	• spice
• conquer	• microscope	• statue
• disease	• moveable type	• technology
• domesticated animals	• natural resource	• telescope
• economy/economic	• painting	• trade route
		• trade/trader

Table 3. Specific Content Words

Specific Content Words — words that are specific to content (e.g., person, place, event). Describe the words and when possible make the connection to a Connecting Concept (e.g., Learning about the Silk Road connects to the understanding of the importance of trading/exchanging goods and services.).

• Africa	• England	• North America
• American Indians	• Europe	• Portugal
• Americas	• France	• Renaissance
• Asia	• Johann Gutenberg	• Silk Road
• Atlantic Ocean	• Leonardo da Vinci	• Sistine Chapel
• Central America	• Marco Polo	• South America
• China	• Michelangelo	• Spain
• Columbian Exchange	• Mona Lisa	• statue of David
• Dutch	• New World	• The Last Supper painting

Ideas to Support Vocabulary Learning

Table 4 includes ideas and examples for teaching vocabulary in a way to build conceptual understanding of the words.

Table 4. Ideas to Teach Vocabulary Effectively (Marzano 2004)[2]

Ideas	Examples
Explain, describe, and/or give examples of the vocabulary word rather than formal definitions.	For example, "A disease is something that makes you sick. Diabetes is a disease."
Have students restate the vocabulary word in their own words. Take this opportunity to help students connect new vocabulary, especially general vocabulary, to prior knowledge.	Use three-dimensional objects or tactile representations for students to match to terms paired with the products traded on the Silk Road (e.g., silk scarf, gold jewelry, paper money, compass, etc.)
Have students represent vocabulary words in pictures, symbols, graphic organizers, or pictographs.	Ask students to complete a vocabulary graphic organizer about vocabulary words related to the Renaissance (see Figure 1 for an example), providing support as needed (e.g., help from peer or adult, viewing model, using alternative and augmentative communication [AAC], etc.).
Provide multiple exposures to vocabulary words in a variety of ways. This does not suggest mass trials, but rather distributed trials in different ways or contexts. Reference http://projectlearnet.org/tutorials/learning_trials.html for information on learning trials. • Expose students by incorporating vocabulary into daily activities when it is appropriate. • Read books or watch videos related to the vocabulary and concepts. • Have students complete activities such as sorting words into categories. • Incorporate vocabulary into art and/or music.	• Watch a video about early Spanish explorers of America (e.g., https://www.youtube.com/watch?v=lPDOhrw6t7o). • Have students sort pictures of things exchanged during the Age of Exploration into plants, animals, and technology. • Have students move pictures of things exchanged during the Age of Exploration from the country/continent of origin to where it was taken. • Listen to songs (e.g., https://www.youtube.com/watch?v=XWY50mH5awQ or https://www.youtube.com/watch?v=3521xURSXk8).
Ask students to discuss the vocabulary words with each other.	• Have students use their mode of communication to use a word in a sentence or choose the sentence that uses the word correctly. • Have students share their representations (e.g., pictures) of their favorite word with each other.

Ideas	Examples
Play vocabulary word games with students.	• Have students play a drag-and-drop matching game to match Renaissance vocabulary to a definition (e.g., http://www.purposegames.com/game/renaissance-vocabulary-matching-quiz). • Play an online vocabulary game using Age of Exploration terms (e.g., https://www.eduplace.com/kids/socsci/books/applications/ewordgame/ca_index_e1.html?book=e1&chapter=3&title=Chapter%203:%20Age%20of%20Exploration). • Have students practice vocabulary using online flashcards that include images and audio descriptions (e.g., https://quizlet.com/158829621/renaissance-flash-cards/).
Have students watch a dramatization or have them act out the vocabulary term.	Act out exchanging/trading classroom tools (e.g., paper, pencil, markers, etc.). Talk about how students can use new tools he/she didn't have before (e.g., now he/she can make a color coded map).

[2] Refer to Section V, Universal Design for Learning (UDL) Suggestions for additional instructional strategies.

Vocabulary Example

To build an understanding of terms related to the Renaissance, have students complete a vocabulary graphic organizer. Have the students cut and paste each picture on the related vocabulary word. See Figure 1 for an example. Educators may need to support, modify, or adapt steps as needed for individual students. For example, one student may have the pictures precut, another student may compete a digital drag-and-drop version, etc. Two National Center and State Collaborative (NCSC) resources are available and may prove helpful:

- Use systematic instruction as described in the NCSC Instructional Guide (https://wiki.ncscpartners.org)
- Reference ideas in the NCSC Vocabulary and Acquisition Content Module (https://wiki.ncscpartners.org)

Figure 1. Example Vocabulary Graphic Organizer
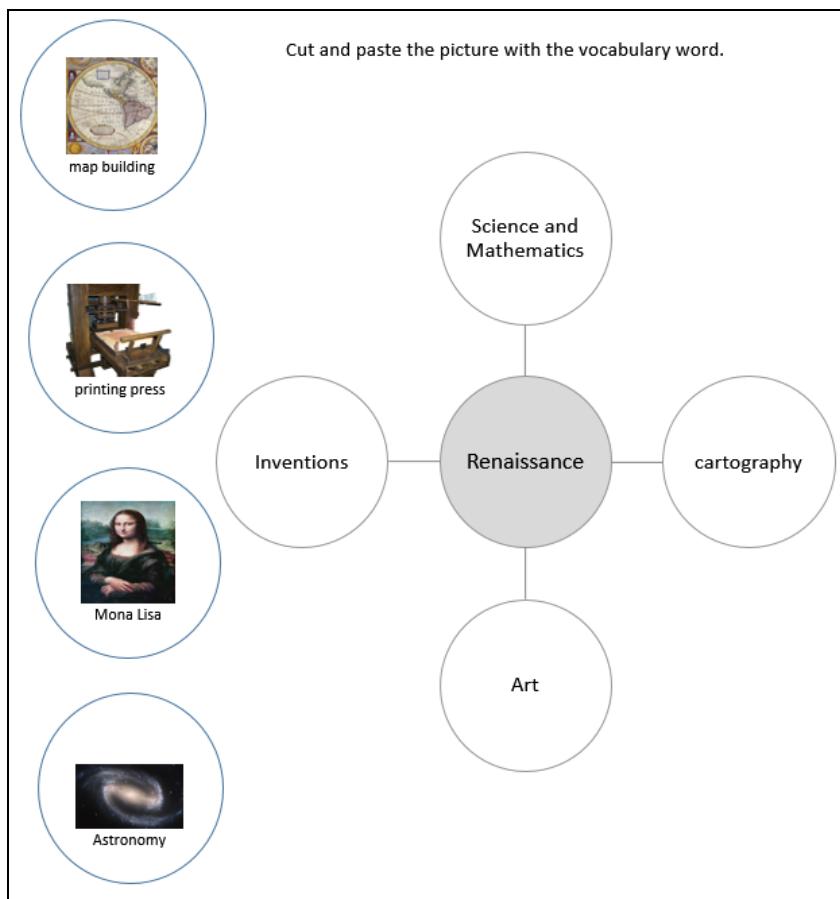
Vocabulary Resources:

Vocabulary.com provides explanations of words using real-world examples. Once signed in, an educator can create word lists for students. http://www.vocabulary.com/

Text Project provides Word Pictures that are free for educators to use. It includes word pictures for core vocabulary and various content areas including science and social studies. This link will take you to the

Word Pictures page where you can select the category of words you want to use.
http://textproject.org/classroom-materials/textproject-word-pictures/

The Teach Tennessee History site has Frayer Model explanations and organizers, along with many other types of organizers that may be useful.
http://www.teachtnhistory.org/index.cfm/m/223/Teacher_Resources/

Education Place provides a variety of graphic organizers to be used for vocabulary instruction that are free to print and copy. http://www.eduplace.com/graphicorganizer/index.jsp

Directions and link to creating an online memory game that can be used for vocabulary or concepts.
https://www.youtube.com/watch?v=XwNAX26J_oQ and http://matchthememory.com/

Section IV

Overview of Units' Content

This section of the module contains additional content and references to support educators' understanding and instruction of the instructional units. The information reflects important content to address the AATs and to build students' knowledge, skills, and abilities; however, it is not exhaustive and should be expanded upon as needed.

Unit 1 – The Renaissance: Students analyze the origins, accomplishments, and geographic diffusion of the Renaissance.

Content:

The Silk Road and Marco Polo

- The importance of trade
- The emergence of trade during the Renaissance
- Relationship between European cities' growth and increased population and demand for local and international goods
- The results of the reopening of the Silk Road between Europe and China
- Marco Polo, his travels, and the importance to growth in European trade (e.g., silk, spices, gold, paper money, compass, coal used as fuel, and rice made into wine)
  - o Location of the routes
- The Silk Road as a means for cultural exchanges between the East (Asia) and the West (Europe)

Advances made during the Renaissance

- Effects of humanism on the revival of classical learning and new interest in the arts
- Reasons for learning new things
- Effects of new ways of disseminating information
- The effect of the growth of cities and trade on the spread of the Renaissance
- Advancements during the Renaissance:
  - o literature (e.g., William Shakespeare)
  - o the arts (e.g., Leonardo da Vinci's painting of The Last Supper and the Mona Lisa; Michelangelo's paintings in the Sistine Chapel and the statue of David)
  - o science (e.g., human anatomy and astronomy)
  - o mathematics (e.g., measuring the size of Earth)
  - o cartography (maps more widely available due to printing press)

- o   engineering (e.g., building techniques such as constructing large domes on churches)
- o   inventions (e.g., Johann Gutenberg's new method of moveable type printing)

Unit 2 – The Age of Exploration: Students compare and contrast the geographic, political, religious, social, and economic structures of the Mesoamerican and Andean civilizations. Students analyze reasons for movement of people from Europe to the Americas, describing the impact of exploration by Europeans and American Indians.

Content:

Exploration of countries

- Exploration and settlement by European countries
  - o   French exploration and settling in Canada
  - o   Spanish exploration and settling in Central America and South America
  - o   English exploration and settling in the United States and Canada
  - o   Portuguese exploration and settling in South America (e.g., Brazil)
  - o   Dutch exploration and settling the New York area
- Reasons for exploration and colonization (e.g., power, economic gain, religion, political rivalry, trade, better trade routes)
- Reasons for successful exploration of and colonization in North America (e.g., navigation tools, better maps, and ships)

Impact on product exchanges

- Advancements in navigation and ship building
- Impact of exchanges between Europe, Africa, Asia, and the Americas during the Age of Exploration
  - o   plants/products (e.g., potatoes, tomatoes, corn from the Americas)
  - o   animals (e.g., cows, goats, sheep, pigs, horses, and chickens to the Americas)
  - o   technology (e.g., guns, steel, and ways to use the wheel)
  - o   culture (e.g., African slaves brought a unique African culture)
  - o   ideas (e.g., religion and languages)
  - o   diseases (e.g., small pox)
- Economic and social effect of exploration and colonization on continents (e.g. capitalism and mercantilism)
- Effect of European exploration on the indigenous American cultures

Unit Content Resources:

Time Maps has a timeline that links to historical maps for a variety of places.
http://www.timemaps.com/history/europe-1453ad

The Silk Road and Marco Polo

- This site includes information, an interactive map, and links to resources about the reopening of the ancient Silk Road and Marco Polo's travels.
  http://www.ck12.org/user%3Aa2fyzw4ubgf3c29uqhrjc2vkds5uzxq./book/Tennessee-7th-Grade-Social-Studies-World-History%3A-the-Fall-of-Rome-to-the-Age-of-Exploration/section/8.4/
- This site provides information on the Silk Road. http://www.ess.uci.edu/~oliver/silk.html
- Unesco provides information on the Silk Road. http://en.unesco.org/silkroad/about-silk-road

- This site provides information on technology and culture exchanged via the Silk Road.
  https://www.travelchinaguide.com/silk-road/culture.htm

- History.com has information and videos on Marco Polo.
  http://www.history.com/topics/exploration/marco-polo

The Renaissance

- Your History Teacher has online text books with information and lesson ideas on the Renaissance.
    - http://yourhistoryteacher.com/Textbook/CJ6_428-433.pdf
    - http://yourhistoryteacher.com/Textbook/CJ6_434-441.pdf
    - http://yourhistoryteacher.com/Textbook/CJ6_444-450.pdf
- CK-12 provides information and resources on the Renaissance.
  http://www.ck12.org/user%3Aa2fyzw4ubgf3c29uqhrjc2vkds5uzxq./book/Tennessee-7th-Grade-Social-Studies-World-History%253A-the-Fall-of-Rome-to-the-Age-of-Exploration/section/8.7/
- Khan Academy provides information on the High Renaissance and Galileo's work with math and science. https://www.khanacademy.org/humanities/renaissance-reformation/high-ren-florence-rome/beginners-guide-high-ren/a/galileo-galilei
- Britannica has information on Renaissance science and technology.
  https://www.britannica.com/topic/history-of-Europe/Renaissance-science-and-technology
- This Prezi presentation includes information on map building during the Renaissance.
  https://prezi.com/ih-pqcwov0w8/renaissance-map-making/

Explorations of countries

- Mr. Gray History provides information on the Age of Exploration, including exploration route maps and videos. http://mrgrayhistory.wikispaces.com/UNIT+13+-+THE+AGE+OF+EXPLORATION
- Texas Gateway has information on European exploration of North America, including interactive exercises and a video. https://www.texasgateway.org/resource/exploration-and-colonization-america
- This site has information and links to resources on European countries responsible for North American exploration.
  http://www.ck12.org/user%3Aa2fyzw4ubgf3c29uqhrjc2vkds5uzxq./book/Tennessee-7th-Grade-Social-Studies-World-History%253A-the-Fall-of-Rome-to-the-Age-of-Exploration/section/10.9/
- Learn NC provides a lesson plan on methods and technologies used by sailors during the Age of Exploration. http://www.learnnc.org/lp/editions/nchist-twoworlds-lessons/2690

Impact on product exchanges

- CK-12 has information and links to resources on the impact of exchanges between Europe, Africa, Asia, and the Americas.
  http://www.ck12.org/user%3Aa2fyzw4ubgf3c29uqhrjc2vkds5uzxq./book/Tennessee-7th-Grade-Social-Studies-World-History%253A-the-Fall-of-Rome-to-the-Age-of-Exploration/section/10.12/
- This site provides information on the biological and cultural exchanges during the Age of Exploration, including a graphic organizer.
  http://www.dcs.k12.oh.us/cms/lib07/OH16000212/Centricity/Domain/293/Age_of_Exploration_Enrichment.htm
- Learn NC has information and a lesson plan on the Columbian Exchange.
  http://www.learnnc.org/lp/editions/nchist-twoworlds-lessons/2652

Section V

Universal Design for Learning (UDL) Suggestions

The three principles of UDL guide development of instruction, instructional materials, and assessments to provide the widest range of students with access to learning. Students with significant cognitive disabilities, especially students with visual and/or hearing impairments and students with complex communication needs, require additional scaffolds, adaptations, and modifications to access content and support learning. The three principles of UDL establish a framework for providing these. UDL provides guiding principles to create instructional materials and activities in a flexible manner to address the needs of different types of learners. Additionally, the flexibility allows for further individualization.

Table 5 provides strategies for the UDL Principle I, **Multiple Means of Representation**: presenting information in a variety of ways to address the needs of different types of learners. Table 6 provides strategies for the UDL Principle II, **Multiple Means of Action and Expression**: providing a variety of ways for students to interact with the instructional materials and to demonstrate understanding. Table 7 provides strategies for the UDL Principle III, **Multiple Means of Engagement**: providing a variety of ways to engage and motivate students to learn.

These strategies can assist all students in understanding the basic concepts. Some of the examples include adaptation ideas for students with vision, hearing, and/or physical limitations. Each example has a code to indicate when it includes specific adaptation ideas for these needs:

V = visually impaired (low vision, blind, or deaf-blind)
H = hearing impaired (deaf, hard of hearing, or deaf-blind)
P = physical disability (limited use of hands)

Table 5. Instructional strategy ideas using the UDL Principle: Multiple Means of Representation

Multiple Means of Representation	
Strategies	**Examples**
Introduce information through a multi-sensory approach (e.g., auditory, visual, tactile).	Have students smell and describe spices that were traded on the Silk Road (e.g., http://www.silkroadspices.ca/history-of-spice-trade). *Check on any allergies students may have.
	Introduce the navigation tools used in the Age of Exploration by having students create a compass, astrolabe, or a quadrant (e.g., printable activities on http://exploration.marinersmuseum.org/resources/). Print on cardstock and use adapted scissors to cut the printed patterns. **P**
	Have students listen to audio recordings on the Age of Exploration (e.g., section 10 on http://mrgrayhistory.wikispaces.com/UNIT+13+-+THE+AGE+OF+EXPLORATION).

Model content through pictures, dramatization, videos, etc.	Have students watch videos about the Age of Exploration and the Columbian Exchange (http://study.com/academy/lesson/the-columbian-exchange-and-the-triangle-trade/ and https://www.youtube.com/watch?v=lpXRvfdy9VE). Have students watch videos on: • the Renaissance (e.g., http://study.com/academy/lesson/the-renaissance-timeline-events-overview.html, https://www.youtube.com/watch?v=xf2G2Il8crw, and https://www.youtube.com/watch?v=Uhd-uwFonog) or • map building (e.g., https://www.youtube.com/watch?v=iWuKM29H16c). Read or watch a play by Shakespeare.
Present information using modified graphic organizers (e.g., simplified organizers with pictures) or maps.	Adapt a cause-and-effect graphic organizer to illustrate the impact of the exchanges between Europe and the Americas during the Age of Exploration (e.g., http://www.teacherweb.com/NC/Chicod/MrsAttardi/columbian-exchange-cause-effect.pdf). Create a tactile timeline (e.g., http://www.perkinselearning.org/activity-bank/tactile-timelines). Have students fill in a graphic organizer (e.g., example toward bottom of http://theartoflearning-bermingham.blogspot.com/2012/01/age-of-exploration.html?m=1), with information on an explorer, the country sending the explorer, reasons for exploration, and accomplishments.
Provide appropriate and accessible text on the content for students to listen to or read.	Paraphrase information from a textbook on large sticky notes. Place the sticky note over the original text, leaving the graphics. Write or type with a bold and plain font (e.g., Verdana, 18 pt. font) with good spacing between lines (e.g., 1.5 vs single spacing). **V** Have students read or listen using a screen reader to online texts (e.g., http://bookbuilder.cast.org/view.php?op=view&book=33469&page=1, http://bookbuilder.cast.org/view.php?op=view&book=96013&page=1, [free registration], https://www.turtlediary.com/biographies/explorers/marco-polo.html), or https://www.turtlediary.com/biographies/artists/leonardo-da-vinci.html).
Teach information using songs.	Have students listen to songs from the Renaissance (e.g., https://www.youtube.com/watch?v=0CRX_mqpzdU).

Table 6. Instructional strategy ideas using the UDL Principle: Multiple Means of Action and Expression

Multiple Means of Action and Expression	
Strategies	**Examples**
Use assistive technology to allow the student to interact with the instructional materials and content.	Create a narrated slide show using simple text and pictures and have the student use a single-switch to advance slides. **V/H/P** Have students view educational videos that have audio descriptions and/or captioning related to the content (e.g., free-loan library at https://dcmp.org/about-dcmp).
Present instructional materials in a manner that provides access.	Place printed text and pictures on a slant board. **V** Provide a description of any viewed paintings or statues from the Renaissance. **V** Provide a container that includes textures, objects, and pictures representing content (e.g., goods traded between Europe and the Americas) for students to explore as related information is read from a textbook or articles. **V/P**
Provide voice output devices for students to select the correct answer.	Record correct answers and distractors on a voice output multiple message switch or multiple voice output switches and have students answer questions using the switch. **V/P** Consider having students use three switches with generic labels (e.g., a, b, c or red, blue, green, three different textures) in which they listen to all three and then select the correct answer. **V/P**
Provide simulation activities.	Have students role-play exchanging goods, including preparing for a long trip and using maps and a compass to sail across the ocean. Connect to early European explorers. Sign all conversations and decisions. **H** Complete digital version using an adapted mouse and/or keyboard (e.g., http://exploration.marinersmuseum.org/wp-content/themes/agesofex/games/merchants/). **P** Have students design and display museum exhibits from the Renaissance or the Age of Exploration (e.g., http://www.learnnc.org/lp/editions/nchist-eg/629).
Create accessible graphic organizers (e.g., a digital graphic organizer that allows drag and drop) and maps.	Have students use an adapted mouse to complete a drag-and-drop Venn diagram on European exploration of North America (e.g., https://www.texasgateway.org/resource/exploration-and-colonization-america). **P** Have students create and interact with a tactile timeline (e.g., http://www.perkinselearning.org/activity-bank/tactile-timelines). Have students explore an interactive map that shows routes of explorers (e.g., http://ageofex.marinersmuseum.org/index.php?page=voyages.)

Table 7. Instructional strategy ideas using the UDL Principle: Multiple Means of Engagement

Multiple Means of Engagement	
Strategies	**Examples**
Provide a schedule and visual timer.	Have students select the next activity on their personal schedule and set the visual timer to indicate how long the student has before a break. Have students use a mini-schedule for specific activities. Have students check off each step of a task as completed.
Vary the challenge and amount of information presented at a time.	Introduce a big idea or broad concept (e.g., explorers) before giving more information on specific explorers, their sponsoring country, and lands explored. Provide information in short blocks of time, gradually increasing the instructional time.
Make connections to topics or activities that are motivating.	Have students watch a video that compares the Renaissance to the growth of ASL through the Internet (e.g., https://www.youtube.com/watch?v=jkyV6E8cnGc). Have students make a connection to social media and historical information by having them create a Fakebook page for Marco Polo (e.g., http://www.classtools.net/FB/home-page).
Allow choices as possible.	Allow students to choose which topic from the Renaissance or the Age of Exploration to research. Allow students to set their academic and behavioral goals with assistance as needed.
Provide opportunities to work collaboratively with peers.	Provide opportunities for students to work in a general education classroom with peers when learning about the Renaissance or have peer tutors come into the special education classroom to work on creating a picture map (e.g., https://support.google.com/maps/answer/2622947?co=GENIE.Platform%3DDesktop&hl=en or https://www.scribblemaps.com/create/) about Marco Polo's travels. Model how to support students' learning for the general education teacher and classmates.
Teach student self-regulation skills.	Provide students communication symbols to request a break or express feelings and model how to use appropriately. Modify the school-wide behavior system to make it accessible for the students.

UDL Resources

The National Center on Universal Design for Learning has a plethora of information on UDL and examples and resources.
www.udlcenter.org

Schoolhouse Rock has a YouTube channel, which includes America Rock Series (e.g., No More Kings).
https://www.youtube.com/user/SchoolhouseRockTV1

Symbaloo is a free online tool that allows an educator to create bookmarks using icons. It is easy to create and allows an educator to provide students links to sources of information that can be used for specific instructional units.
www.symbaloo.com

This site provides a brief description of Symbaloo and multiple ways to use the online tool.
https://www.theedublogger.com/2014/04/09/11-ways-to-use-symbaloo-in-the-classroom/

Perkins School for the Blind provides information on using tangible symbols to increase communication, create personal schedules, and provide choices.
http://www.perkinselearning.org/videos/webcast/tangible-symbols

Teaching History provides directions for adapting documents for classroom use.
http://teachinghistory.org/teaching-materials/teaching-guides/23560

Section VI

Transfer and Generalize Concepts, Knowledge, and Skills

For learning to be meaningful for all students, including students with significant cognitive disabilities, it is important to intentionally make connections to future content, real-world application, and college and career readiness skills. For example, explain how the local community gets products that are not grown or produced locally or in the United States. Additionally, the instruction of social studies concepts, knowledge, and skills may be the catalyst to developing other areas such as needed communication skills, reading/listening comprehension, age-appropriate social skills, independent work behaviors, and skills in accessing support systems. Table 8 provides instructional ideas to help transfer and generalize concepts, knowledge, and skills and suggested opportunities to embed other skills into instruction.

Table 8. Transfer and Generalization Ideas

Area	Instruction	Opportunity to Embed Skills
Communication	While teaching vocabulary, make connections to real-life or future opportunities to use the words (e.g., discussing art and literature with friends, family, and coworkers).	Use the context of the content area instruction to increase language skills, work on articulation, or access alternative and augmentative communication (AAC) systems.
Reading and Listening Comprehension	Provide information through reading books and articles when working on reading/listening comprehension or word identification.	Provide practice on communication skills when students are answering questions about the book or article.
Age-Appropriate Social Skills	Make connections between the Connecting Concepts and real-life experiences showing how they can read maps to locate a friend's house, a store, etc.	Provide opportunities to work alongside same age peers to practice age-appropriate social skills.
Independent Work Behaviors	Encourage and reinforce independent completion of tasks to build independent work skills.	Use positive behavior supports in place to encourage and reinforce independent work skills.
Skills in Accessing Support Systems	Encourage students to ask appropriately for assistance from peers and adults when working on the content.	Use this time to have the student work on behavior and communication skills.

Section VII

Concepts and Vocabulary Multi-Age Planning: Grades Six through Eight

Multi-age planning requires that instructional decisions address the span of the grade levels of the students in the class. Recognizing the Connecting Concepts and the General and Specific Vocabulary that apply to multiple units within and across a grade span provides information to teach concepts that build a foundation for specific curricular content (i.e., specific people, places, events, and time periods). This section illustrates the grade-level **Connecting Concepts** and the **General and Specific Vocabulary** across grades six through eight. This view (see Tables 9 – 13) allows educators of multi-age and multi-grade classrooms to address the same or similar concepts and vocabulary to all students along with the specific curricular content.

Table 9. Physical and Human Geography Concepts and Vocabulary

Physical and Human Geography		
Geographical features and the spatial organization of people and places impact different stages in the history of culture and civilization. Maps and other representations of places and regions convey the influence of geography on economic development, discovery, and use of resources by various cultures and civilizations.		
Grades 6 - 8	**Concepts**	**Vocabulary**
AAT: Identify reasons why the region of Mesopotamia is referred to as the Fertile Crescent. (6.8) • **UC:** Use a map to identify a geographical feature in Mesopotamia. **AAT:** Identify information related to the development of the ancient Israelites (e.g., the location of the migration; reasons for the migration; who led the migration). (6.40) • **UC:** Identify reasons why groups of people may want to migrate from one location to another. **AAT:** Explain how the location of ancient Athens affected maritime trade across the Mediterranean Sea. (6.47) • **UC:** Identify countries likely to trade with Athens by sea using a historical map. **AAT:** Explain how having access to the sea or agriculturally productive land contributed to Roman society (e.g., supported a large society). (6.61) • **UC:** Identify how the creation of roads helped build the Roman Empire. **AAT:** Explain how the travels of Marco Polo contributed to the growth of European trade. (7.45) • **UC:** Identify a reason why trade is important to groups of people. **AAT:** Identify reasons why European countries	**Understand:** • how to think spatially and use a variety of maps and map tools (e.g., compass rose, legend) • how to interpret physical and political features on a variety of maps • how geography and climate affect exploration • how geography affects where people live, trade, and travel • how geography affects growth of a society • how geography affects a region's economy • the impact of the roads on growth of a society • reasons why groups of people migrate from one place to another • the importance of explorers, land and	**General:** • agriculture • ancient • architecture • art • boundary • calendar • colony • community • country • culture • desert • development • farm • fertile • flood • hieroglyphics • industry • irrigation • maritime trade • migrate/migration • papyrus • political • productive • products • region • roads

Physical and Human Geography		
Geographical features and the spatial organization of people and places impact different stages in the history of culture and civilization. Maps and other representations of places and regions convey the influence of geography on economic development, discovery, and use of resources by various cultures and civilizations.		
were successful in colonizing in North America. (7.71) • **UC:** Identify countries that colonized North America. **AAT:** Identify differences between agriculture in the South and industries in the North. (8.72) • **UC:** Identify products manufactured in the North or products grown in the South using a historical resource map.	sea routes on trade, migration, and colonization	• route • settlers • slavery • society • technology • trading centers **Specific:** • Arab world • Asia • Athens • Black Sea • Caspian Sea • Caucasus Mountains • Cumberland Gap • Dead Sea • Dutch • Egypt • England • Euphrates River • Europe • Fertile Crescent • France • Giza • Israelites • Jackson Purchase • Marco Polo • Mediterranean Sea • Mesopotamia • Natchez Trace • North America • Persian Gulf • Portugal • Pyramids • Rome • Sea of Galilee • Silk Road • Song Dynasties • South America • Spain • Sphinx • Tigris River • Zagros Mountains

Table 10. Culture Concepts and Vocabulary

Culture		
Advancement and growth of human culture and civilization relates to development of literature, the arts, science, mathematics, and engineering in times past and present, and affects how people live in particular places.		
Grades 6 - 8	**Concepts**	**Vocabulary**
AAT: Identify the importance of irrigation, the wheel or the sail to the growth of Mesopotamian civilizations (e.g., the invention of the wheel for transportation in Mesopotamia got people to places they wanted to go quickly). (6.12) • **UC:** Identify an important use of the wheel in today's world. **AAT:** Identify an important use of a system of writing in the Mesopotamian civilization (e.g., allowed news or ideas to be carried to distant places without having to rely on a messenger's memory). (6.13) • **UC:** Identify an important use of print in today's world. **AAT:** Identify the importance of achievements of Egyptian civilization (i.e., the invention of a calendar; architecture and arts, such as the Pyramids and Sphinx at Giza; writing-hieroglyphics; and the invention of paper). (6.19) • **UC:** Identify an important use of the calendar in today's world. **AAT:** Identify information related to the development of the ancient Israelites (e.g., the location of the migration; reasons for the migration; who led the migration). (6.40) • **UC:** Identify reasons why groups of people may want to migrate from one location to another. **AAT:** Compare the importance of architecture or engineering contributions of ancient Rome to engineering achievements in today's modern day world (i.e., roads, aqueducts, or bridges). (6.70) • **UC:** Identify a feature of today's society related to achievements of Ancient Rome (e.g., roads, aqueducts, or bridges). **AAT:** Identify a relationship between the growth of a kingdom and the development of culture and learning in West or North Africa (7.13) • **UC:** Match the growth of a community to an increase in the number of schools. **AAT:** Identify how Chinese technology (e.g., papermaking, wood-block printing, the compass	**Understand:** • the effect of new developments, technology, and inventions and their improvements on people's lives in the past and present • how people and places can affect learning, art, architecture, and literature • how learning, art, architecture, and literature affect people's lives • the relationship between learning and growth/advancement of societies • the effect of exchanging goods on people living in different places (e.g., new products, diseases, etc.) • reasons people move to different places • importance of leaders to guide/affect change	**General:** • agriculture • anatomy • aqueduct • arch • architecture • arena • army • art • bath • belief • bridge • calendar • cartography/map building • central heating • civilization • community • compass • continent • culture • disease • domesticated animals • economy • engineering • exchange • gunpowder • hieroglyphics • invention • irrigation • kingdom • law • leader • literature • mathematics • metal-smithing • migrate • papermaking • papyrus • plow • plumbing • poetry • print

Culture		
Advancement and growth of human culture and civilization relates to development of literature, the arts, science, mathematics, and engineering in times past and present, and affects how people live in particular places.		
or gunpowder) helped people during the Song Dynasties. (7.23) • **UC:** Identify an important use of the compass in today's world. **AAT:** Identify how advances in science, mathematics or map building helped people during the Renaissance. (7.48) • **UC:** Identify a reason why learning new things is important. **AAT:** Identify an effect of the exchange of products (e.g., potatoes, tomatoes, or corn) between the Americas and the world. (7.74) • **UC:** Identify important agricultural products (e.g., potatoes, tomatoes, or corn) exchanged between people living in different places.		• product • record keeping • roads • sail • sanitation • science • slavery • sphinx • system of writing • technology • trade • transportation • wheel • wood-block printing **Specific:** • Abraham • Americas • Ancient Rome • Canaan • China/Chinese • Circus Maximus • Coliseum • Egypt • Europe • Ghana • Israelites • Jenne • Johann Gutenberg • Leonardo da Vinci • Mali • Mesopotamia • Michelangelo • Moses • New World • North Africa • North America • Pyramid at Giza • Renaissance • Song Dynasties • Songhai • Sphinx at Giza • Timbuktu • West Africa • William Shakespeare

Table 11. Economics Concepts and Vocabulary

Economics
Human and physical capital, natural resources, and technology on a local and global scale impact production, distribution, and consumption of goods and services. Decisions about how to use resources influence the welfare of individuals and societies.

Grades 6 - 8	Concepts	Vocabulary
AAT: Identify the importance of trading goods for the development of cities (e.g., Timbuktu) in West or North Africa. (7.16) • **UC:** Match the growth of a community to an increase in commerce and trade. **AAT:** Identify ways agriculture or trade helped people during the Song Dynasties. (7.22) • **UC:** Match an increase in farmland to an increase in food production. **AAT:** Identify a sequence of events that led to peasants becoming a merchant class. (7.41) • **UC:** Identify why a successful community needs many people who can do different jobs. **AAT:** Identify events associated with the discovery of gold in California (e.g., people traveled to California; the population of California grew; development of new mining techniques). (8.63) • **UC:** Identify a change to a community that results from the discovery of a nearby natural resource (e.g., gold, coal or oil).	**Understand:** • basic economics • types of goods and services • the importance of trading/exchanging goods and services • how goods and services are exchanged • reasons people move to and/or leave places • benefits, reasons, and ways groups cooperate • types of economies and the effects of change in an economy (e.g., jobs, where people live, what they spend money on, etc.) • how natural resources affect a community	**General:** • agriculture • banks • city • coal • commerce/commercial • community • family • farm • gold • goods • jobs • labor • merchant/merchant class • mining/miners • natural resource • oil • peasants • school • state • technology • town • trade **Specific:** • 49'ers • California • John Sutter • Song Dynasties • United States • West Africa

Table 12. Civics and Politics Concepts and Vocabulary

Civics and Politics		
Responsible and effective citizens understand structures of power and authority and the principles they reflect; their role within a community, a nation, and the world; and develop civic efficacy. Connections to the past and the way governments, principles, and traditions have developed impact current societies.		
Grades 6 - 8	**Concepts**	**Vocabulary**
ATT: Identify an element of direct democracy in Ancient Greece. (6.49) • **UC:** Identify why rules are important in a society. **AAT:** Identify a democratic principle of the Roman Republic related to today's government in the United States (e.g., citizens choose representatives to govern on their behalf, separation of powers, and a written constitution). (6.63) • **UC:** Identify why the opportunity to vote is important to a citizen. **AAT:** Identify a reason why farmers exchanged their land or their freedom to powerful landowners (e.g., protection, reliable food source or land for wood gathering). (7.33) • **UC:** Identify a feature of a manor (i.e., the thick impenetrable walls) that provided safety. **AAT:** Identify the Mayflower Compact as a set of rules; and that it provided a plan of government for the Pilgrims' colony. (8.3) • **UC:** Identify a reason why people need a system of government to choose leaders and make laws. **AAT:** Identify ways that leadership led to the American victory over the British during the American Revolution. (8.25) • **UC:** Identify why groups of people need leaders. **AAT:** Identify how the principles of the U.S. Constitution affect life in the modern United States. (8.33) • **UC:** Identify an individual right of a citizen in the United States. **AAT:** Identify the sequence of events that led to the development of Tennessee statehood using a timeline. (8.39) • **UC:** Identify a reason different groups of people (i.e., early settlers in Tennessee and Native Americans) need to cooperate with each other. **AAT:** Identify the importance of the Emancipation Proclamation in 1863. (8.76)	**Understand:** • the structure and purpose of government and its relationship to democracy and citizenry • how the United States of America became an independent country and a democracy • citizens of the United States have rights and responsibilities	**General:** • amendment • ancient • battle • checks and balances • citizen • civic duty • colony • constitution • cooperate • culture • democratic principles • direct democracy • economy • emancipation • farm • feudalism • freedom • government • inaugural • landowners • laws • leader • manor/manorialism • maritime trade • medieval • physical geography • polis/city-state • representative democracy • representatives • rights • river • rule of law • rules • safety • separation of powers • settlers • statehood • timeline • victory • vote

Civics and Politics		
Responsible and effective citizens understand structures of power and authority and the principles they reflect; their role within a community, a nation, and the world; and develop civic efficacy. Connections to the past and the way governments, principles, and traditions have developed impact current societies.		

• **UC:** Identify ways a person can influence the actions or decisions of a group of people.		• western
		Specific:
		• American Indian
		• American Revolution
		• Ancient Greece
		• Battles:
		   o Lexington
		   o Concord
		   o Bunker Hill (Breed's Hill)
		   o Trenton
		   o Princeton
		   o Saratoga
		   o King's Mountain
		   o Yorktown
		• Benedict Arnold
		• Bill of Rights
		• British
		• Capture of Fort Ticonderoga
		• Cumberland Gap
		• Emancipation Proclamation (1863)
		• Europe
		• Francis Marion
		• Friedrich Von Steuben
		• George Rogers Clark
		• George Washington
		• Gettysburg Address (1863)
		• Greece
		• Hessians
		• House Divided speech (1858)
		• Jackson Purchase
		• John Sevier
		• Marquis de Lafayette
		• Mayflower
		• Mayflower Compact
		• Natchez Trace
		• Pilgrim
		• Plymouth Colony
		• Preamble
		• Rocky Mount
		• Roman Republic

Civics and Politics		
Responsible and effective citizens understand structures of power and authority and the principles they reflect; their role within a community, a nation, and the world; and develop civic efficacy. Connections to the past and the way governments, principles, and traditions have developed impact current societies.		
		- Separatists - Squanto - Tennessee - Treaty of Holston - US Constitution - United States - Valley Forge - William Blount - William Bradford

Table 13. History: Change, Continuity, and Context Concepts and Vocabulary

History: Change, Continuity, and Context		
Historical events, the processes of change and continuity over time, the context within which events occur, and the significance of the contributions by individuals from various ethnic, racial, religious, and socioeconomic groups impact the development of civilizations and societies around the world.		
Grades 6 – 8	**Concepts**	**Vocabulary**
AAT: Identify actions the colonists took to protest British taxes (e.g., petitions, boycotts of British goods, chasing British tax collectors out of town). (8.22) • **UC:** Identify ways a person can advocate for himself or herself. **AAT:** Identify causes of the Texas War of Independence. (8.59) **UC:** Identify reasons that cause disputes among groups of people. **AAT:** Identify how the Underground Railroad helped slaves move northward to freedom. (8.66) • **UC:** Identify reasons why slaves would want to escape (such as living conditions, family structure, etc.).	**Understand:** • causes of disagreements and conflict between countries and groups of people • ways groups of people advocate for rights and freedom • importance of people's actions in history • importance of leaders to guide change	**General:** • abolitionist • boycott • colonist • escape • freedom • goods • leader • petition • political • protest • settlements • slaves • social • tax • war **Specific:** • Alamo • Benjamin Franklin • David Crockett • Elihu Embree • Francis Wright • Frederick Douglass • Free Hill, Tennessee • Harriet Beecher Stowe • Harriet Tubman • John Adams • John Brown • John Hancock • Mercantilism • Nashoba Commune • Patrick Henry • Pontiac's Rebellion • Sam Adams • Sam Houston • Sons of Liberty • Texas • Texas War of Independence

History: Change, Continuity, and Context		
Historical events, the processes of change and continuity over time, the context within which events occur, and the significance of the contributions by individuals from various ethnic, racial, religious, and socioeconomic groups impact the development of civilizations and societies around the world.		
		• The Boston Massacre (1770) • The Boston Tea Party (1773) • The Declaratory Act (1766) • The Emancipator • The Intolerable Acts (1774) • The Liberator • The Proclamation of 1763 • The Quartering Act (1765) • The Slave Narratives • The Stamp Act (1765) • The Sugar Act (1764) • The Townshend Act (1767) • Thomas Jefferson • Uncle Tom's Cabin • Underground Railroad • Virginia Hill • William Lloyd Garrison

References:
National Council for the Social Studies (NCSS), *The College, Career, and Civic Life (C3) Framework for Social Studies State Standards: Guidance for Enhancing the Rigor of K-12 Civics, Economics, Geography, and History* (Silver Spring, MD: NCSS, 2013).

Section VIII

Tactile Maps and Graphics

The maps and graphics guidelines will help create tactile versions of instructional maps, diagrams, models, and timelines to use with students who are blind or deaf-blind. The tactile maps and graphics may be beneficial to other students as well. A tactile graphic is a representation of a graphic (e.g., picture, drawing, diagram, map, etc.) in a form that provides access through touch. It is not an exact copy of the graphic. The section provides basic guidance and links to more comprehensive resources.

Importance of Tactile Maps and Graphics

It is important to provide tactile graphics for young readers (BANA, 2010). It helps students understand and gain information when presented with science and social studies concepts, knowledge, and skills. Science instruction often presents diagrams (e.g., water cycle) and two-dimensional models of living and nonliving things (e.g., model of cell) to teach the related concepts. Social studies instruction often uses maps and timelines to illustrate where and when people existed and events occurred. The following guidance includes information to build upon when creating tactile graphics.

Tactile Graphic Guidance

1. **Determine need for graphic**: When encountering graphics in instructional materials, determine if the graphic is essential to understanding the concept. The Braille Authority of North America (2010) provides a decision tree to help in this determination. It can be accessed online at http://www.brailleauthority.org/tg/web-manual/index.html by selecting "Unit 1 Criteria for Including a Tactile Graphic."
2. **Consult with the local educator trained to work with students with visual impairments**.
3. **Determine the essential information in the graphic.** Read the surrounding information and the caption to determine which information in the graphic to exclude. For example, a map to illustrate location of key countries would not need state lines and capital cities and may not need all of the surrounding countries.
4. **Reduce unnecessary detail in the graphic.** Identify details that are not necessary for interpreting the information in the graphic. For example, a model of the water cycle may show crevices on the mountains, leaves on a tree, and waves in an ocean. Eliminate unnecessary details, as they are difficult to interpret tactilely.
5. **Remove frames or image outlines if they serve no purpose.** Ensure that all lines are necessary (e.g., line that indicates a body of water), and remove any that are not.
6. **Modify the size of the graphic.** Modify the graphic as needed to reduce clutter and allow a blank space between adjacent textures. Additionally, consider the size of the student's hand.
7. **Use solid shapes as feasible.** When solid shapes do not clearly represent the information, use clear solid lines.
8. **Systematically teach exploration and interpretation of tactile graphics.** Systematic instruction and repetition are important when teaching a student to understand a tactile graphic. Pairing the tactile graphic with a 3-dimensional object may help (e.g., pair a raised line drawing of a pencil, an example of goods, with a pencil).

Specific Graphic Type Guidance

Following is information for specific types of graphics that may support instruction in science and social studies.

Graphic Organizers/Concept Maps

- It is best to present information to compare or make connections in a tactile graphic. A tactile graphic presents the information in a spatial display and aids in comparison better than a list.

Diagrams/Models

- Limit the number of areas, lines, and labels. Having more than five makes interpretation difficult.
- Consider pairing a tactile graphic with a 3-dimensional model.

Timelines

- Present timelines in the same direction every time (i.e., horizontal or vertical).

Maps

- Distinguish water from land using a consistent background texture for the water.
- Align the direction of the compass rose arrows with the lines of longitude and latitude on the map.

Creating Tactile Graphics

Following are some ways to create tactile graphics. Additional information can be found at www.tactilegraphics.org.

Commercial products:
- Capsule paper or swell paper – print
- Thermoform

Textures shapes can be made from:
- Sticky back textured papers found at craft stores
- Corrugated cardboard
- Fabric with texture (e.g., corduroy, denim)
- Silk leaves
- Cork
- Felt
- Vinyl
- Mesh tape (used for drywall)
- Sandpaper

Raised lines can be made from:
- Glue (best not to use water-based glue)
- Wax pipe cleaners

Resources

Creating Tactile Graphics created by the High Tech Center Training Unit provides basic principles of tactile graphics, characteristics of good tactile graphics, the planning process, guidelines for designs, and more. http://www.htctu.net/trainings/manuals/alt/Tactile_Graphics.pdf

The Texas School for the Blind and Visually Impaired provided basic principles for Preparing Tactile Graphics, element arrangement on a tactile graphic, resources for preparing quality graphics, etc. http://www.tsbvi.edu/graphics-items/1465-basic-principles-for-preparing-tactile-graphics

Perkins School for the Blind has short videos that explain the importance of tactile graphics and information on spatial relationships and graphic literacy, moving from models to graphics, and strategies for reading tactile graphics. http://www.perkinselearning.org/videos/webcast/teaching-tactile-graphics

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Picture Citations

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