Using Mnemonics and Graphic Organizers to Increase Social Studies Text Comprehension and Content Recall for Students with Learning Disabilities

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Abstract

The complex expository texts that secondary students must read in the social studies are frequently challenging for students with learning disabilities: connections between important concepts are often implicit; single paragraphs can contain a tremendous density of information, and much of this information is irrelevant to main ideas. In addition, students are asked to remember and recall much of the factual information contained within these texts. In this paper we provide two research-supported instructional tools—visual mnemonics and graphic organizers—that have been shown to increase social studies text comprehension and recall of content knowledge for secondary students with learning disabilities. We describe how teachers can use each of these instructional strategies with social studies texts to improve student comprehension, content knowledge, and recall of information.

Keywords: teaching methods, learning strategies, social studies instruction, reading comprehension, learning disabilities

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Mrs. Rodriquez, a teacher of special education at Jefferson Middle School, faces the same complaints every year from her students. Today, she is hearing them all over again as she tries to understand why two discouraged eighth-graders, both with learning disabilities, are having such a hard time succeeding in their U.S. History class.

"I like my U.S. History class, but I hate reading the textbook," Ana explains. "I read the words out loud, but they don't stick in my head; I can't remember any of the details that are on the test."

"I read the same paragraph seven times, and it still *doesn't make sense," Henry adds.*

These complaints reflect what teachers of secondary students with learning disabilities already know; text comprehension is a formidable challenge for many of their students of U.S. History, World Geography, and other subjects within the social sciences. So, how can a teacher help his or her students read social studies texts to both understand what was read and to remember the critical facts?

It is not surprising that students with learning disabilities (LD) have a hard time understanding and remembering the information contained within their social studies textbooks. Many secondary students lack the reading skills necessary to comprehend complex expository text. Only a little more than one-third of all students in 8th and 12th grade were considered proficient in reading on the most recent National Assessment of Educational Progress (National Center for Education Statistics, 2011). Just 8% of eighth-graders with disabilities and 12% of twelfth-graders with disabilities exhibited proficient reading skill.

Proficient reading skills are critical in secondary social studies classrooms, where students are frequently asked to comprehend textbooks, primary source documents, and historical articles in order to acquire content knowledge (Gersten, Baker, Smith-Johnson, Dimino, & Peterson, 2006). The new Common Core Standards (CCS) identify the importance of academic, discipline-specific literacy and comprehension of complex text in the social studies (Common Core State Standards Initiative, 2010). However, the particular density and complexity of these texts make it difficult for students with reading problems to synthesize information and read for understanding. Indeed, a recent report from the Carnegie Corporation noted the ubiquity of "inconsiderate" texts in the social studies. These texts fail to make explicit the causal connections between propositions; use references that are ambiguous, distant, or indirect; include information irrelevant to main ideas; and present a tremendous density of ideas within individual sentences (Lee & Sprately, 2010). For secondary students with LD, who frequently exhibit language deficits, difficulty with higher-level processing and identifying relevant information, and insufficient background knowledge to make connections, reading and understanding these texts can be a significant challenge (Bulgren, Deshler, & Lenz, 2007; Deshler et al., 2001; Fletcher, Lyon, Fuchs, & Barnes, 2007).

What Does Research Say?

Findings from reviews of experimental intervention research indicate there are several instructional strategies or supports that teachers can use to help secondary students with LD comprehend social studies texts and enhance recall of content information from text (Swanson et al., 2012; Gajria, Jitendra, Sood, & Sacks, 2007). The most research exists for two strategies applied to secondary social studies text learning: visual mnemonics and graphic organizers. Moderate to large effects have been noted for middle and high school students with LD when

they learn to apply visual mnemonics or graphic organizers to their social studies text learning (Swanson et al., 2012; Gajria et al., 2007).

Visual mnemonics connect new information with a familiar image. Because "students with disabilities learn new information better when concreteness is enhanced, and when new information is effectively encoded and elaborated with prior knowledge" (Mastropieri, Scruggs, & Whedon 1997, p. 18), visual mnemonics can be very useful tools for students with LD. Mnemonic instruction has repeatedly produced better recall of historical information for students with LD than more rote instructional routines such as rehearsal (e.g. Brigham, Scruggs, & Mastropieri, 1995; Mastropieri & Scruggs, 1989; Mastropieri, Scruggs, Bakken, & Brigham, 1992).

Graphic organizers have been recommended as tools to help students with LD read for meaning and understand relationships between concepts across the subject areas (Kim, Vaughn, Wanzek, & Wei, 2004). They "enhance the reading comprehension of students with LD, possibly by helping these students organize the verbal information and thereby improving their recall of it" (Kim et al., 2004, p. 114). In addition, the research shows that they are remarkably effective in helping students with LD to comprehend and learn from social studies text in particular (e.g. Bos & Anders, 1992; Boon et al., 2005; DiCecco & Gleason, 2002; Scanlon, Deshler, & Schumaker, 1997).

Using Visual Mnemonics *and* Graphic Organizers with Social Studies Texts

At first glance, visual mnemonics and graphic organizers are similar instructional tools. Both seek to make abstract information concrete—to turn words into pictures. Upon further consideration, though, visual mnemonics and graphic organizers are quite different, in terms of both function and applicability. Mnemonic instruction generally aims to help students recall

facts presented in text (e.g., Mastropieri & Scruggs, 1989; Scruggs & Mastropieri, 1989): Who was Alexander Hamilton? Which countries formed the Central Powers? What was the United States' policy on immigration at the end of the Gilded Age? Graphic organizers, on the other hand, help students understand concepts, and relationships among concepts: they enable students to more effectively compare and contrast, link causes and effects, and differentiate between main ideas and details (e.g., Darch & Eaves, 1986; Scanlon et al., 1997). Mnemonic instruction teaches students to answer the "who," "what," "where," and "when" questions of social studies; graphic organizers can help to answer "why" and "how."

Guidelines for Using Visual Mnemonics

Visual mnemonics represent new information as an "elaborated" image, or "pictorial interaction" (Scruggs & Mastropieri, 1989). They show a question interacting with the answer to that question—visually connecting a person, place, or event with a key fact. This sort of representation helps students to organize, store, and retrieve new information introduced in a text (Scruggs & Mastropieri, 1989).

Scruggs and Mastropieri (1989) differentiate between three types of visual mnemonics: *acoustic elaborations*, *symbolic elaborations*, and *mimetic elaborations*. Acoustic elaborations can be used to help students remember information about people, places, or events that have unfamiliar names. Symbolic elaborations assist students in remembering a fact about a person, place, or event associated with a familiar symbol. Mimetic elaborations support students' memorization of facts about familiar people, places, or events. Descriptions and examples of each type of mnemonic are below.

There are four steps that teachers can follow when using an acoustic elaboration: (a) identify a keyword that sounds like the unfamiliar name students need to recall from the text, (b)

determine the important information that students will need to associate with this name, (c) sketch an image that visually connects the keyword with this important information, and (d) summarize and discuss with students how the visual image can help them retrieve both important information and unfamiliar name, helping them to identify questions for which the mnemonic will aid them in supplying an answer (e.g., Terrill, Scruggs, & Mastropieri, 2004).

Imagine that a teacher is trying to help students make sense of a text that describes the publication of the Federalist Papers and Alexander Hamilton's views on the proper role of the federal government within the new United States. Knowing that Hamilton's name is unfamiliar to students, the teacher will want to develop an acoustic elaboration that would help students remember both Hamilton's name and an important idea related to him. First, the teacher would select a "keyword" that sounds like Hamilton's name ("ham" would be an obvious choice). Second, he or she would help students identify the most important information in the text related to Alexander Hamilton. Third, the teacher would sketch (or, even better, help students develop and draw) an image that visually connects this important information to the keyword, "ham." If the most important fact presented in the text is Hamilton's advocacy for a strong federal government, the sketch might look something like the image in Figure 1: a picture of a ham in front of a "strong" federal government (a White House that is flexing muscular biceps). Finally, the teacher would give students an opportunity to discuss the image and the meaning it contains. The teacher may want to provide students with questions that enable them to practice retrieving the information contained in the mnemonic. The teacher might explain that, when asked, "Who was Alexander Hamilton?" students can (a) remember their keyword, "ham," (b) remember the picture of the ham, (c) remember what else was happening in the picture, (d) retrieve the answer to the question (e.g., Terrill, Scruggs, & Mastropieri, 2004). Conversely, when faced with the

question, “Which of the founding fathers advocated for a strong federal government?” students can remember the picture of the strong White House with the ham in front of it and recall that the ham was a keyword for Hamilton, thus retrieving his name.

Symbolic elaborations are slightly different from acoustic elaborations. They picture a symbol (in place of an acoustically-similar keyword) engaged in a meaningful action. Thus, the steps or process for applying the mnemonic are similar to acoustic elaborations, but instead of identifying a keyword to connect to the information, a symbol is identified. Imagine that students are reading a textbook chapter about America’s “Gilded Age.” It is important for them to remember that, at the end of the Gilded Age, the United States began to pursue policies restricting immigration. Knowing that the United States (or any nation, really) is easily represented with a symbol, their teacher would use a symbolic elaboration to help students recall this fact. First, the teacher would choose a symbol to stand in for the United States: Uncle Sam might be a good choice. After reminding students who Uncle Sam is and what he symbolizes, the teacher would help students sketch an image like the one in Figure 2: a picture of Uncle Sam by a wall or a closed gate, with a crowd of people on the other side. Finally, the teacher would review the meaning of the mnemonic with students. He or she would explain that, when students are asked about immigration policy in the United States at the end of the Gilded Age, they can think of Uncle Sam and the immigration-related picture connected to him. Thus, the students will be able to retrieve the answer to the question: the United States began pursuing policies to restrict immigration; just as Uncle Sam proclaims in the picture, the United States proclaimed that American jobs were “for Americans first!”

Mimetic elaborations are simply pictorial interactions that directly represent facts, with no intervening symbol or keyword. Imagine that the goal is to help students remember that,

during the Gilded Age, factory workers (including children) labored long hours for little pay. This textual information is not connected with an unfamiliar name; it does not involve a thing that is easily represented with a symbol. It would be most helpful, then, to supply students with (or, again, help students draw) a mimetic elaboration like the one in Figure 3: a direct visual representation of the fact that students are trying to commit to memory. The first step, then, involves identifying an important fact in the text and choosing the best visual representation of that fact. Next, teacher or students sketch the image. Finally, the teacher will again need to review the meaning of the mnemonic with students, and provide them with questions that enable them to practice retrieving the information contained within it. He or she can explain to students that, when they are asked about working conditions in factories during the Gilded Age, they can think of the image and recall the relevant fact.

Because students with learning disabilities encompass a wide range of complex needs, teachers may want to scaffold or modify the steps they use to introduce visuals. For example, for students who have difficulty identifying main ideas, teachers will need to spend more time supporting efforts to determine the important information for which mnemonics are needed. If a student has difficulty with auditory processing, a teacher may want to help him or her create a visual key for each component of a mnemonic (e.g. picture of a ham = "ham" = Hamilton; White House = federal government; picture of bulging biceps = strong). For students who have difficulties with expressive language or other language deficits, teachers will want to spend additional time explaining the relationship between the visual images and the words or concepts that they represent, and to give students more opportunities to practice articulating in words the information that the elaboration encodes. In order to support these students, teachers may want to introduce the concept of mimetic elaborations first, and to introduce symbolic and acoustic

elaborations—with their intervening, indirectly representative keywords and symbols—later. On the other hand, for students who have difficulties with visual processing, teachers may want to focus more on acoustic elaborations, which appeal to students' auditory processing strengths.

Guidelines for Using Graphic Organizers

As well as relating facts, social studies texts introduce historical concepts and relationships: they compare and contrast, describe causes and effects, and allude to trends and themes. Teachers must not only help their students to remember Theodore Roosevelt as the twenty-sixth president of the United States, but also to compare and contrast his presidency with other presidencies (how, for example, did his policies—and his personality—differ from Woodrow Wilson's?). As well as recalling the identity of Alexander Hamilton, students must be able to understand the set of circumstances and the chain of events that led to the convocation of the Constitutional Convention and the ratification debates in the state legislatures, connecting multiples events described in the text.

Graphic organizers use "lines, arrows, and a spatial arrangement" to "describe text content, structure, and key conceptual relationships" (Darch & Eaves, 1986, p. 310). In doing so, this tool provide learners with a meaningful framework for relating prior knowledge to new information and enable them to make connections among new concepts. Graphic organizers, in other words, are excellent tools for helping students focus on the relationships between concepts that are crucial to constructing understanding in history and other subjects in the social studies. Graphic organizers can also help students compare and contrast, establish cause and effect, sequence events, and order concepts according to hierarchical importance.

These five steps teachers can follow when using graphic organizers: (a) identify the structure of the text that students are reading and choose a graphic organizer that matches this

text structure, (b) provide students with a brief explanation as to how this type of graphic organizer can aid in their comprehension of the text, (c) model how to enter information into the graphic organizer, giving opportunities for student participation, (d) transfer responsibility for the completion of the graphic organizer to students, and (e) encourage students to explain the conceptual relationships represented in the finished organizer (e.g., Scanlon et al., 1997; Conley 2008).

The first step is a crucial one. Some social studies textbooks introduce information in the form of main ideas and details. Other texts describe a sequence of steps or events, and the (often causal) relationships among them. Still others compare and contrast two or more people, groups, or societies (or documents, events, technologies). When using graphic organizers, teachers should consider how a particular text is structured and select a graphic organizer that matches this text structure.

The familiar main-idea-and-details organizer, for example, is best paired with texts that employ a descriptive, enumerative structure (Boon et al., 2005, Scanlon et al., 1997). In this type of organizer, main ideas are typically placed in large boxes or circles, and details are placed in subordinate positions underneath, alongside, or radiating outward from each main idea. Imagine that students are learning about Aztec civilization by means of a text describing this ancient people and listing details related to geography, government, religion, agriculture, and cultural/technological innovations. First, their teacher would preview the text with students and establish that it has a descriptive structure (and thus pair it with a main-idea-and-details organizer). Second, the teacher would make sure that students understand the way in which the structure of the organizer will help them keep track of the main ideas in the text, and see how details support each main idea. Third, as she or he begins reading, the teacher would model

placing main ideas (e.g. “The Aztecs were a very inventive people”) in a prominent position on the page, and listing supporting details (e.g. “they observed the stars and the planets and developed a calendar,” or “they created a system of writing using pictures and symbols”) in subordinate positions (perhaps in small text boxes or “bubbles” radiating outward from each main idea). Fourth, the teacher would transfer responsibility for the completion of the organizer to students. As students read and enter information into the organizer, the teacher would circulate around the room, asking questions, praising on-target answers, and providing immediate, corrective feedback to prevent misguided practice (Conley, 2008; Hattie & Timperley, 2007; Vaughn, Gersten, & Chard, 2000). When students have completed their graphic organizers, the teacher would make sure they get a chance to explain (to a partner or to the whole class) what main ideas they selected from the text, and what details they found in support of at least one main idea.

Teachers can follow the same steps in conjunction with other text structures or varieties of graphic organizer. If students need to make sense of a text that describes a series of steps or a string of causes and effects, a sequential organizer might be most helpful (Scanlon et al., 1997). This type of organizer typically looks like a series of text boxes, each one pointing, via arrows, to the next. If, for example, students are reading a text that describes the events that led up to the battles of Lexington and Concord, they can organize occurrences in a sequential organizer, thus visualizing their cause-and-effect nature. Doing so would lead to completed graphic organizers that look something like the one in Figure 4. Because text that describes a series of steps or causes and effects is particularly ubiquitous in social studies classrooms, an organizer that visually sequences important events could help students interpret and analyze a large number of the texts they encounter in this content area.

When students read a text that compares and contrasts two or more people, places, events, or perspectives, they will want to use an organizer that facilitates comparison (Scanlon et al., 1997). Venn diagrams are one type of graphic organizer suited to this task. Teachers can also use a compare-and-contrast organizer like the one in Figure 5 to represent contrasting perspectives within a historical time period. The organizer in Figure 5 would be useful for a student who is struggling to comprehend a text that describes the conflicting viewpoints held by British Parliament and the patriot Sons of Liberty in the wake of the Townshend Acts and the Boston "Massacre."

Finally, teachers can mix and match features of the above organizers to create graphic organizers that fit unique text structures (DiCecco & Gleason, 2002). For example, if students need help in understanding the interdependent relationship between industrialization, immigration, and urbanization during the Gilded Age—as well as in representing the defining details of each of those main ideas, a teacher might help students develop a graphic organizer like the one in Figure 6. This organizer resembles a main-ideas-and-details chart; it also, however, includes arrows that indicate cause-and-effect, or sequence in time. These combination, or multi-component, organizers are flexible enough to complement a wide variety of social studies text structures.

Teachers may need to modify graphic organizer instruction in order to meet the diverse needs of their students with LD because this population of students often struggle to identify the structure or organization of text (Gersten, Fuchs, Williams, Baker, 2001). Therefore, teachers may want to provide extra scaffolding to help some students identify text structure, perhaps by creating a key that shows clue words (e.g. "similar," "alike," "different," or "on the other hand" in the first sentences of a passage can signal that the text is comparing or contrasting two things).

These students may also benefit from each graphic organizer being clearly labeled with the name of the text structure for which it is appropriate. In addition, some students might find it helpful to include illustrations, in addition to words. Finally, some students may benefit from extra practice articulating in words the relationships that are represented in graphic organizers. Keep in mind that numerous graphic organizers are provided online too, such as, http://www.mywebspiration.com or http://bubbl.us

Moving Toward Independent Use

As suggested in the examples above, research indicates that it is helpful for teachers to gradually transfer responsibility for creating mnemonics and graphic organizers to students (Boyle & Weishaar, 1997; Dunston, 1992). In order to achieve this goal, teachers can use graphic organizers and mnemonics frequently being consistent about types or formats as well as the ways students are taught to use these tools (Baxendell, 2003; Conley, 2008). Initially, when students are using teacher-created mnemonics or graphic organizers, they should have frequent opportunities to respond and participate (Bos, Anders, Filip, & Jaffe, 1989; Bos & Anders, 1997). During instruction, teachers can help students be active participants, so that they are identifying key facts and text structures, discussing connections between ideas, and participating in the construction and interpretation of the graphic organizers and visual mnemonics they use. Gradually, teachers can withdraw their support and enable students to create their own graphic organizers and visual mnemonics as they read text independently.

Concluding Thoughts

The instructional strategies presented here will permit teachers to differentiate instruction based on the social studies content being learned by students and the text structure used to convey that content, as well as students' specific learning needs. The versatility of the strategies

allows students to use these tools in combination and across settings. For example, a teacher could first support students in using a compare-contrast chart as they read about the differing perspectives proclaimed by British Parliament and the Sons of Liberty after the Boston Massacre in their social studies classroom. Then, in the resource room setting, a visual mnemonic could be used to help an individual student (or a small group) remember an important fact about Crispus Attucks, for example, or Samuel Adams.

Over time, as teachers come to know the textbooks and topics that students study in their social studies classes, they accumulate a vast, flexible repertoire of graphic organizers and visual mnemonics that can assist their students with LD in comprehending text and learning important content. If these tools are used frequently and consistently during instruction, and if they are given many opportunities to participate while teacher support is gradually reduced, students will learn to use these visual mnemonics and graphic organizers independently. Once they are able to do so, they will be able to make sense of social studies text and learn social studies content on their own, even without a teacher by their sides.

Figure 1: Acoustic Elaboration:

Teachers can use acoustic elaborations to help students remember information about people, places, or events that have unfamiliar, difficult-to-remember names. The acoustic elaboration below can help students remember that Alexander "Ham" Hamilton was an advocate for a strong federal government.

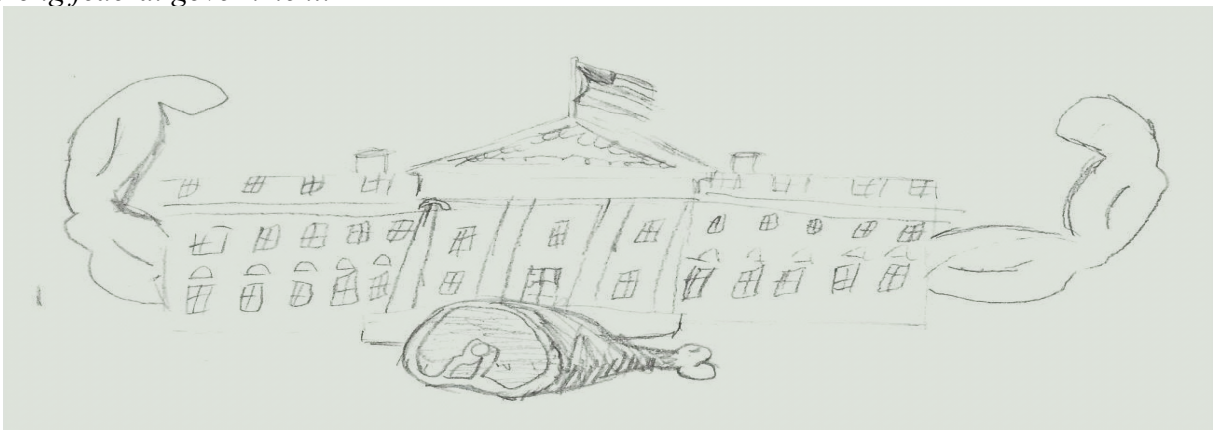


Figure 2: Symbolic Elaboration

Symbolic elaborations are an appropriate tool for teaching students a fact about a person, place, or event associated with a familiar symbol. The elaboration below is meant to help students remember that America (symbolized by Uncle Sam) began to pursue policies restricting immigration at the end of the Gilded Age.

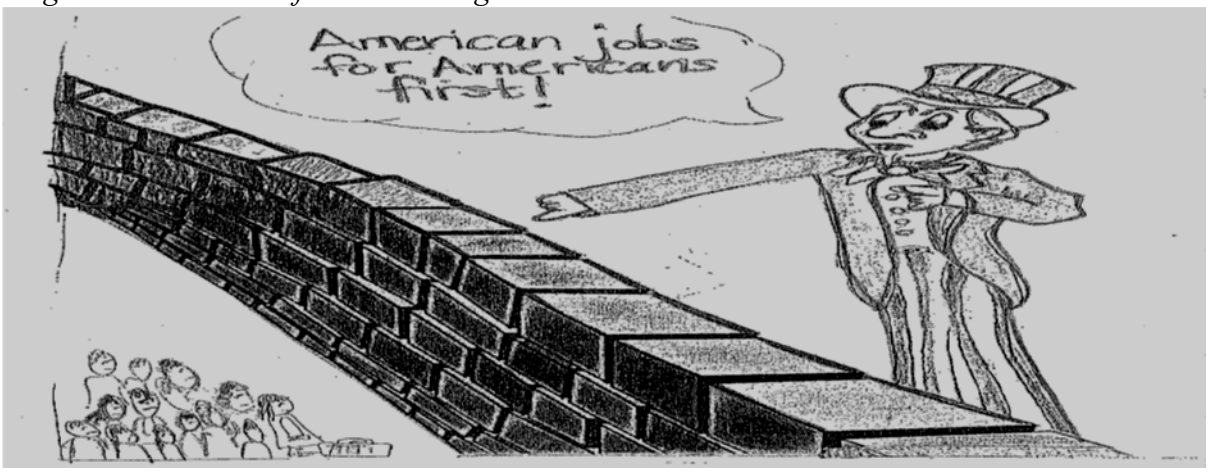


Figure 3: Mimetic Elaboration

Mimetic elaborations are useful for teaching students facts about people, places, or events with familiar names (or without names that need to be remembered). The mimetic elaboration below is meant to help students remember that, during the Gilded Age, factory workers labored long hours for little pay.

Figure 4: Sequential Organizer

A cause-and-effect chart is one type of sequential organizer. In a sequential organizer, the flow of steps or events in a text can be represented with arrows, and they can be arranged sequentially from left to right. Text boxes can also be numbered, in order to provide even more clarity about the order or direction of flow (Baxendell, 2003).

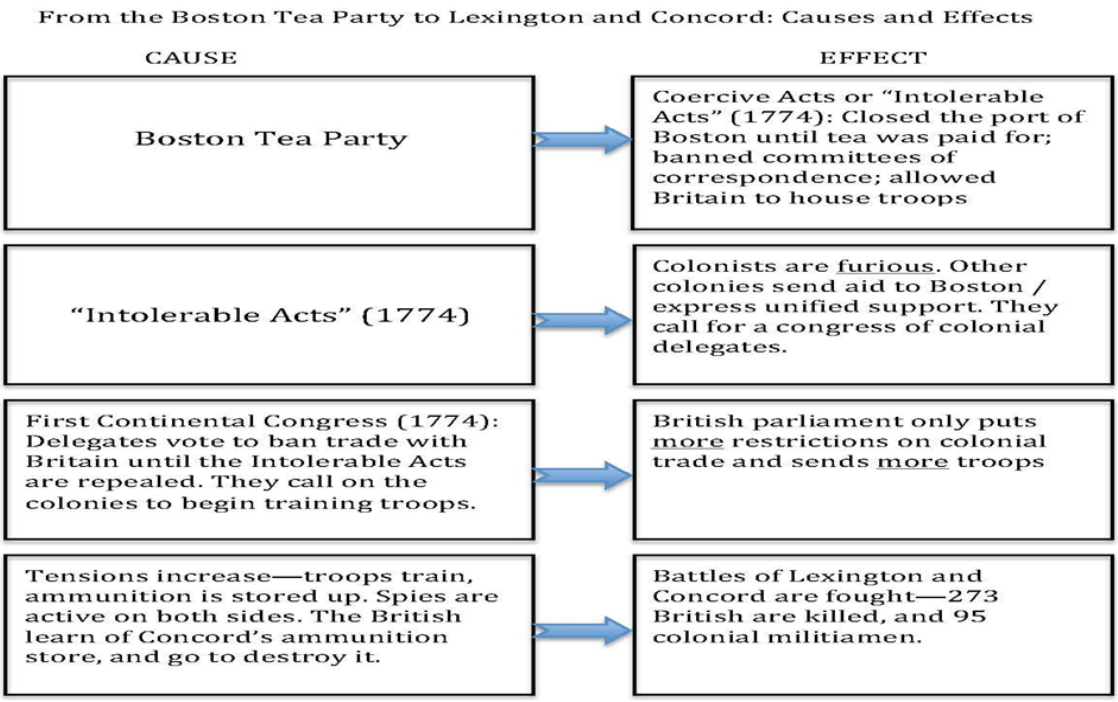


Figure 5: Compare-and-Contrast Organizer

This organizer compares and contrasts historical perspectives. However, it could easily be adapted to contrast people, places, events, primary source documents, technologies, or any other comparable things described in social studies texts.

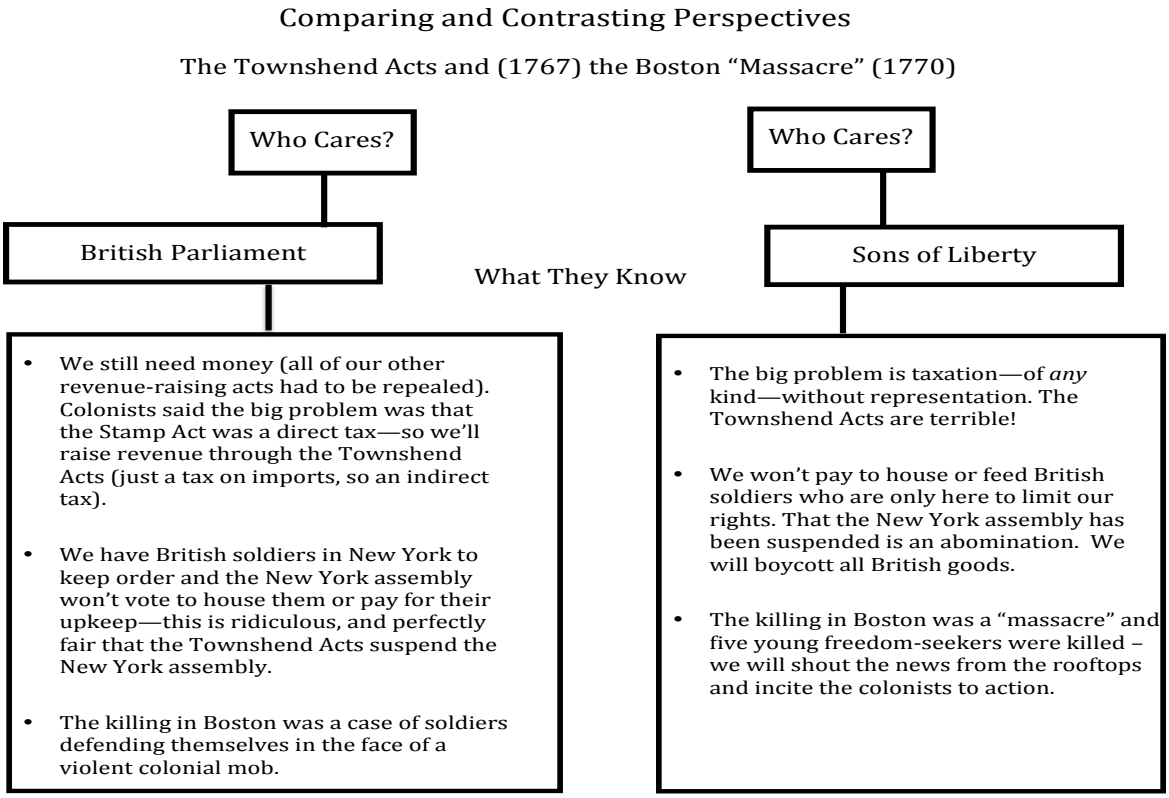
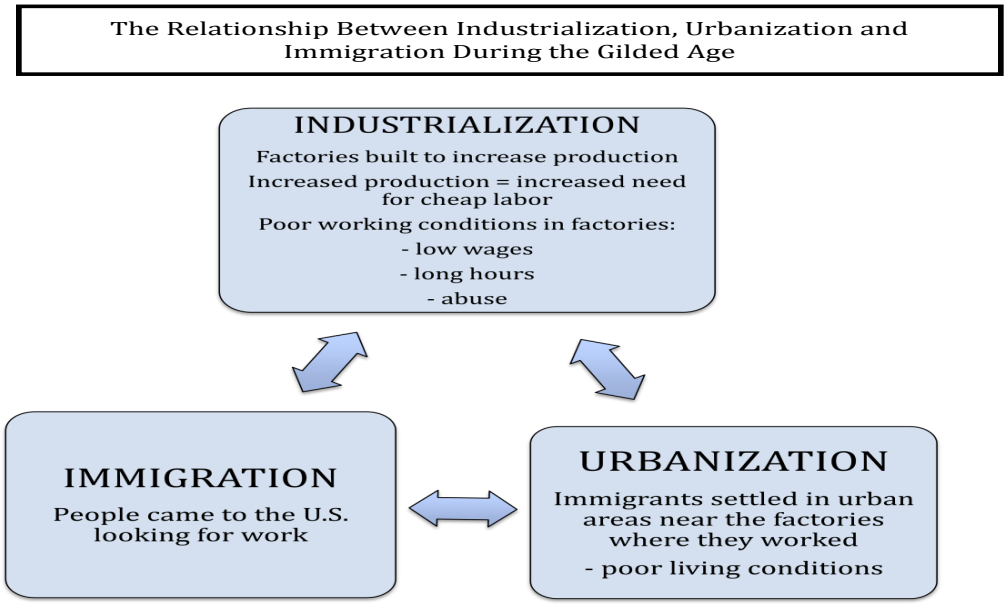


Figure 6: Multi-component Organizer:

This organizer combines features of a main idea-and-details chart with elements of a cause/effect organizer (arrows indicate sequence in time or cause and effect).



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