Papyrus to PDA

Unit Summary

High school graphic arts students determine which invention in the history of visual communication has had the greatest impact on social, political, and economic life. After listening to a lecture, reading, and participating in a discussion, students brainstorm a list of inventions related to print communication that have had great impact on human action or thought. After narrowing the list to four, students engage in independent and then group study of one invention or development. Student teams organize and synthesize their thinking and research efforts using the *Seeing Reason* mapping tool, and then develop an oral presentation supported by media (such as a pamphlet, slides, or Web page). Presentations inform and persuade, and lead to juried debate, where the merits of each argument are weighed.

At a Glance

Grade Level: 9-12
Subjects: Social Studies
Topics: Industrial Technology, Inventions and Technology
Key Learnings: Progress of Print Technology, Impact of Print Inventions, Cause and Effect Relationships in Complex Systems
Time Needed: 12 hours
Background: From the Classroom in Texas, United States

Curriculum-Framing Questions

- **Essential Question**
  Why is there no end to innovation? Why change the way things are?
- **Unit Questions**
  Are we changed superficially or fundamentally by new technology?
  What invention in the history of visual communication has had the greatest impact on social, political, and economic life?
- **Content Questions**
  How did the ability to print multiple copies of text affect communication?
  What are some of the changes that electronic communication has made in the world?
  What are some of the cause and effect relationships that come into play whenever a new or changed technology is introduced?

Things You Need

Instructional Procedures

Introduce the Project and Focus Efforts

Pose the Essential and Unit Questions, *Why is there no end to innovation? Why change the way things are?* and *Are we changed superficially or fundamentally by new technology?* Ask students to think individually about how technology has affected their lives. Have each student make a chart of relevant technologies and their effects. Then ask the students to share their ideas in small groups. In a class discussion, bring out differing opinions and encourage students to offer evidence to support their claims. Let students know that during this project they will be studying inventions that have had a great impact on people's lives.

Through lecture and selected readings, introduce students to the history of graphic and written communication. Ask the Unit Question, *What invention in the history of visual communication has had the greatest impact on social, political, and economic life?* Guide a brainstorming session and have the class generate an initial list of inventions that meet the criterion. Have students provide evidence to support each invention on the list. Help students to identify and focus on the cause and effect relationships associated with each invention. Then, debate the relative merit for including each invention before reaching a consensus regarding which four inventions are the most significant and should be included on the final list.

Outline the scope of the project using the project procedures guidelines.

Engage in Initial Research

Assign one of the four inventions that were selected by the class to each student. Have students research and gather evidence to further support the position that the invention truly had the greatest impact on social, political, and economic life. Guide students as they use the Internet and selected print and electronic resources to collect information.

After independent research is complete, group the students by common invention. Then, have students compare and share their information with other students in their group. Their goal is to synthesize individual research results, and find and fill gaps by using the causal mapping tool presented in the next section. The research and presentation plan scoring guide can be given to students to direct their efforts. Use the Multistate Academic and Vocational Curriculum Consortium (MAVCC) standards* to assess group effort.

Guide Research Synthesis with the *Seeing Reason Tool*

Instruct students on the use of the *Seeing Reason Tool*, and make a sample causal map together. Show students how the Factor and Relationship functions work, and set standards for how these are described. (In these descriptions, you may want students to include definitions, quotes, citations, or data.) Show how the Comments communication feature works as well, and come to agreement on how it will be used in this project. Have the teams make one relationship between two factors, and then save their first map to the team portfolio. Review the maps before students go on.

As students continue researching their topics and building causal maps, check in frequently both in person and asynchronously during prep time to guide work. Use the Comments feature to give feedback, redirect effort, supply resources, suggest new avenues of study, and ask for clarification about the team's thinking.

As students complete research and synthesis, have them continue to follow the project procedures guidelines (described earlier in the unit) as they develop a presentation plan. Review the plan before students develop brochures, Web pages, or slideshow presentations to support their arguments. If desired, show students a sample student presentation. To illustrate their reasoning, students might want to include causal map screen shots or links in the supporting media. Encourage students to use props, reenactments, and other dramatic methods to strengthen their presentations.

Encourage students to practice, using the presentation scoring guide as their standard.

On presentation day, order group appearances based on which peripheral devices are needed. Instruct students in the audience to take notes as the other students present. The notes will help students to build their arguments for the upcoming debate.

Give students time to organize, practice, and then present their arguments and counterarguments using the debate format. You might want a member from each team to serve on a panel of judges. Following the debate, hold a debriefing session, and ask students to weigh the merits and weaknesses of each argument that was presented. Seek consensus on which invention did indeed have the greatest impact on social, political, and economic change.

To wrap up the unit and help students to reflect on what they learned, have students compare their initial thoughts with their current thoughts. Use the following versions of the Curriculum-Framing Questions as guides:

- *What invention in the history of visual communication do you now feel has had the greatest impact on social, political, and economic life? What are the factors that influenced your change of opinion?*
- *Are we changed superficially or fundamentally by new technology? Why?*
- *Why is there no end to innovation? Why change the way things are?*

Additionally, you might want to assess student learning by asking students to respond in writing to the prompt, *What will be the next greatest innovation to change the world?*

Prerequisite Skills

- Interactive communication skills and cooperative work skills
- Reading and writing in expository mode
- Oral communication
- Basic research skills, including note taking and citing references
- Basic computer skills, including using the following functions and tools:
  - Saving information to various drives or servers
  - Desktop publishing and multimedia applications
  - Search engines (such as AltaVista*, Ask Jeeves*, or Google*)
  - Electronic resources (such as CD-ROM encyclopedias)
  - Peripherals, including printers, digital cameras, and scanners

Differentiated Instruction

Resource Student

- Use cooperative groups with grade-level peers to assist the student
- Adjust the guidelines for the research component based on individual modifications for special needs students

Gifted Student

- Instruct the student to enhance the presentation by exploring the moral issues associated with the social and political changes brought about by each invention
- Encourage the student to provide technical expertise in the development of the multimedia presentation, newsletter, or Web designs for the group

English Language Learner

- Support the student with ESOL staff
- Provide a first language and English technical dictionary for translating terms
- Pair an English language learner with a more advanced bilingual student who shares a common first language

Assessment Processes

Use the research and presentation plan scoring guide to grade individual research effort, group effort, and presentation plans. Use the presentation scoring guide to grade final presentations.

Credits

Sarah Little participated in the Intel® Teach to the Future program, which resulted in this idea for a classroom project. A team of teachers expanded the plan into the example you see here.

Sarah Little
Papyrus to PDA

Expert Planning
Sarah Little put her expertise in photography, printing, and industrial arts to good use when she developed a history of graphic arts unit plan for her students at Splendora High School, in Splendora, Texas. With twenty years of teaching experience and certification in science, math, business, vocational education, and distance learning under her belt, Little was certainly equipped to create a cross-curricular teaching plan. The Intel® Teach to the Future course afforded her the opportunity to develop a unit that applied new technologies and teaching techniques and put students in charge of their own learning. "Papyrus to PDA" is the result.

Little recently taught her history of graphic arts unit, and reflects on its success. "Students enjoyed the learning process throughout the unit, because it was not delivered in the traditional lecture format, she says. "They took ownership of their projects, and liked working together. There was a spirit of healthy competition when they checked out their classmates' work. It was also nice for me, as the teacher, to assume the role of facilitator."

Using the *Seeing Reason Tool*
The *Seeing Reason Tool* plays a pivotal role in this unit. Little learned about *Seeing Reason* around the time she started planning her unit. Causation is at the heart of the question her students were charged with answering, and she could see how the tool would aid students as they made a case for which print technology had the greatest impact on civilization. As she imagined, *Seeing Reason* was instrumental in helping students form, organize and support their ideas. "The mapping tool pushed students to apply higher-order thinking skills, and helped them make a visual model of their deductions. This definitely helped them defend their reasoning in the final debate."

Having used the tool in class, Little can recommend how to introduce *Seeing Reason*. "I suggest setting up a mock set of data the first time the tool is introduced so students get a feel for the program and how the factors and relationships work. One time was all it took for my students to pick up the basics of using the tool."

Learning with Projects
Little takes a project-based approach to all her courses. "I do mostly projects with my students. The content of industrial arts demands it, and projects mirror the real world." Little infuses technology into all of her projects. "Technology resources help me put responsibility for learning in the hands of the students," Little says. "I believe most people retain knowledge better with a kinesthetic approach, which technology provides. Interest is really high when students are in command of their processes (which technology encourages), and they learn more."

Little finds technology and a realistic scenario can yield powerful results. "In desktop publishing, my students create an imaginary company. They poll the community to gauge interest in potential new businesses, and translate their results into visual displays of data. They analyze their poll results as they decide which business to develop. Each group meets with a banker to discuss the financing of a small business loan. They consider the needs of their business and clientele, and scout out a physical address for their company within our community. Graphic arts skills are put to the test as each team designs a logo for its business, and creates business cards, stationery, brochures, and even a 'grand opening' flyer."

Little believes authentic, technology-rich projects and tools like *Seeing Reason* are essential for meeting the needs of a changing learning environment. "As technology infiltrates our schools and our world, I foresee the entire structure of education changing. Educators need to keep up. If you have been teaching the same way for an entire teaching career, it's time to change your methods!"

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Designing Effective Projects: Papyrus to PDA

Content Standards and Objectives

Targeted Content Standards and Benchmarks

Texas Essential Skills (TEKS)

Graphic Communications

- Demonstrate knowledge of the basic principles of offset and other printing processes.
- Demonstrate knowledge of new and emerging technologies which may affect the field of graphic communication technologies.
- Apply the competencies related to resources, information, interpersonal systems, and technology in appropriate settings and situations.
- Compose type and related images using computerized or other equipment and processes in art and copy preparation as directed.
- Demonstrate the principles of group participation and leadership related to citizenship and career preparation.
- Demonstrate effective oral and written communication skills with individuals from varied cultures, including fellow workers, management, and customers.
- Create communication materials utilizing color, text, and graphics.

Student Objectives

Students will be able to:

- Recognize that the modern world is the result of vast and ongoing technological change
- Learn that today's graphic media are the result of a long progression of innovation and represent one moment in time from which even more innovations will spring
- Think about systems, and cause and effect relationships
- Make a supported argument

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Resources

Materials and Resources

Printed Materials

- Hird, K. F. (1995). *Offset lithographic technology*. Tinley Park, IL: Goodheart-Willcox Publishers.

Technology—Hardware

- Cameras to take pictures for presentations
- Computer(s) for research and presentations
- Digital cameras for presentationsInternet connection for research

Technology—Software

- Database/spreadsheet for presentations
- Desktop publishing for presentations
- Encyclopedia on CD-ROM for research
- Internet Web browser for research
- Multimedia for presentations

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Papyrus to PDA: Visual Communication through the Ages
Project Procedures

1 Introduction and Overview

We have discussed the power of visual communication, both in graphic and written forms. We considered inventions or developments that have occurred across time and reduced the list to the four we can agree are most significant. You have selected or been assigned one invention to study and make a case for its significance. You will conduct independent research using electronic and print resources, then combine your work with the ideas of others who studied the same invention. Together you will synthesize your research into an effective, well-reasoned oral presentation for the class. You can use your choice of supporting media during the presentation. The audience will take notes during the presentations and use them as they develop an argument and counterarguments for the subsequent juried debate. Finally, we'll see if we can agree on which of the four inventions is most important of all.

2 Individual Research Procedures

Note: Use the Research and Project Plan scoring guide to guide your efforts through Parts 2-4. Your research is the persuasive evidence that your invention had the greatest impact on social, economic and political change. You may type or handwrite your notes, but either way, organize your information into a readable format. Keep track of all print and electronic citations. Turn in a copy to the teacher before group work begins. You must include, but are not limited to, the following information in your research:

- Who invented it
- Where and when it was invented
- What earlier innovations or inventions it sprang from
- How it was made and distributed
- How it affected social change (examine the following criteria):
  - What social impact it produced and how
  - What political impact it produced and how
  - What economic or job impact it has produced (statistics and numbers)
  - Bonus! Track the innovations in this device, method, material, or product since its origin. Compare our most modern version to the original.

3 Group Research Procedures

After individual research is completed, join into groups by invention topic. Compare and share answers and strategies for finding the information. This is the point where we will use the Seeing Reason causal mapping tool to guide and organize research. Organize cumulative data into a single report format. For this part of the project, each person in the group will be graded on their group participation based on the Multistate Academic and Vocational Curriculum Consortium (MAVCC) STANDARDS*. Bonus! You may want to conduct a school survey to gauge which of the four inventions students believe had the greatest impact on social and political change.

4 Presentation Plan

Work in your invention groups to produce an oral presentation with supporting media. Your presentation has two major purposes, to INFORM and PERSUADE. Use the bottom portion of the Research and Presentation Plan scoring guide to focus your efforts.

5 Practice and Present

Once you have planned your oral presentation, decide which supporting media serves you best, either a slideshow, pamphlet, or Web page. Develop these media and determine how they will be used during the presentation. Refer to your Presentation scoring guide as you practice. Think ahead to questions the audience may ask. You will field five questions from the audience. When you are in the audience, take notes. Notes will help you plan your debate argument and counterargument.

6 Debate!

An informal, juried debate will be held, with one member of each team serving on a panel of judges, and one or more team members acting as debaters. You will not be graded for participation in the debate, but will receive extra credit if you do so!

7 Grading

You will be graded for individual research, group work and your presentation plan using the Research and Presentation Plan scoring guide. You will be graded for the presentation using the Presentation scoring guide. The applicable scoring guides are handed out at each new phase of the project, so you will be aware of the objectives you are graded on. Copies are posted on the bulletin board as well for your reference. Good luck and have fun with this project!

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Research and Presentation Plan Scoring Guide

View as Word* document

Scoring Guide Research and Presentation Plan

Group Invention_____ **Date**_____

	TOTAL VALUE	YOUR SCORE	COMMENTS
Individual Research			
Utilizes variety of resources effectively: Internet, textbook, encyclopedia	10		
Uses research time effectively	5		
Information follows guidelines, is complete, and accurate	10		
Typed or written notes are produced	5		
All works properly are cited	5		
Group Research			
Uses causal tool to represent ideas, synthesize research results	5		
Group Share and Compare (MAVCC Standards)			
Student follows instructions	5		
Applies active listening skills	5		
Demonstrates principles of group participation and leadership	10		
Presentation Plan			
Shows comprehension of main ideas	5		
Makes a justified case, supported by evidence from research	15		
States ideas clearly, organizes them into appropriate format	15		
All works properly cited	5		
TOTAL POINTS **Final Grade:**	**100**		

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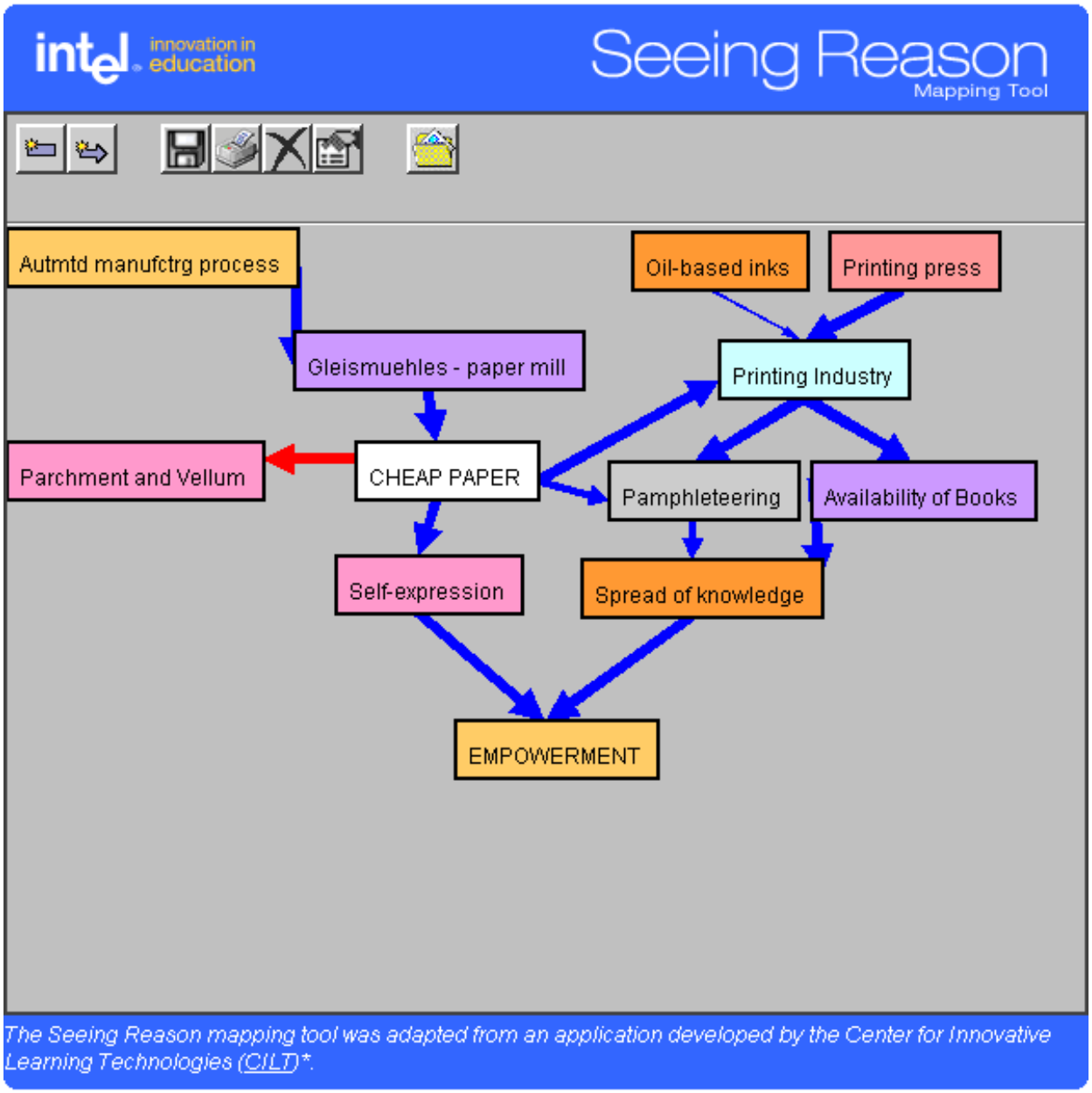
Sample Student Map

Building Causal Maps

What invention in the history of visual communication has had the greatest impact on social, political, and economic life?



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Designing Effective Projects: Papyrus to PDA

Presentation Outline

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Course: Graphic Arts
Group: Paper Pushers
Papyrus to PDA: Visual Communication Through the Ages
Summary of Notes for Oral Presentation

Here is an outline of our presentation.

We will be using a slideshow to support our presentation.

Introduction
The debate is about the history of visual communication, and deciding which invention had the greatest social, political, and economical impact.

Taking a Stand for Paper (our choice)
After research and investigation, we think paper had the greatest impact on social, political, and economic change, because even today, it is the medium on which most text is conveyed, whether it's stamped, impressed with hot lead, handwritten or laser printed.

History of Paper
Who invented: Ts'ai Lun, an official in the Chinese Royal Court
Where invented: in the Chinese Royal Court
When invented: in A.D. 105
Before there was "paper," Egyptians made papyrus from pounded reeds around 4000 B.C. Greeks developed heavier-duty parchment from dried animal skin (especially sheep) later on.

Background Info
How it was made and distributed: Ts'ai Lun's paper was made from rags, used fishing nets, hemp, and China grass. Paper makers mixed mulberry bark, hemp, and rags with water, mashed it to a pulp, pressed out the liquid, and hung the thin mat to dry in the sun. BONUS: MB is working on "paper through the ages" and will have samples of papers made of linen, wood pulp, parchment, and synthetic materials.

Introduce and Walk through Causal Map
Our map shows:
Social Impact

- Lower cost and increased availability stimulated foundation of new schools and universities
- Led to increase in levels of literacy and education
- Cheap paper production made written word available to new classes in society
- Changed fundamental process of thinking; changed from an oral to a literate culture when started to think in a more linear fashion, because one can work out on paper more complicated thought processes, and memorization no longer required

Economic Impact

- Paper industry started: mills founded: jobs produced
- Wood pulp process perfected
- When paper became cheaper, newspaper industry was founded (first with block print, then moveable type, now digital silk-screening)
- Drop in newsprint prices due to papermaking technology changed price from 28 cents per pound in 1864 to two cents a pound in 1897

Political Impact
Words on paper helped governments with organization and control (example: tax bills and edicts)
Early practices (and even laws passed) to control exchange of ideas, example: disallowing "rags" or treatises to be taken out of the country
Until the printing press was developed, written word was in the hands of educated elite, religious groups (monks were often scribes)
Newspapers spread news and political information much faster than oral transmission

Conclusion
Our conclusion is that paper had the greatest impact on political, economical, and social change, because it allowed all printing-related industry to develop. Without paper, words would not have become portable. Without paper, a person's words could not have been distributed as far and wide.

Works Cited

History of Paper by Conservatree: www.conservatree.com/learn/Papermaking/History.shtml*
Paper Through the Ages: www.hqpapermaker.com/paper.htm*
Wisconsin Paper Council: www.wipapercouncil.org/invention.htm*
Paper University: www.tappi.org/paperu/all_about_paper/paperHistory.htm*
Institute of Paper Science and Technology: www.ipst.gatech.edu/*

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Student Example

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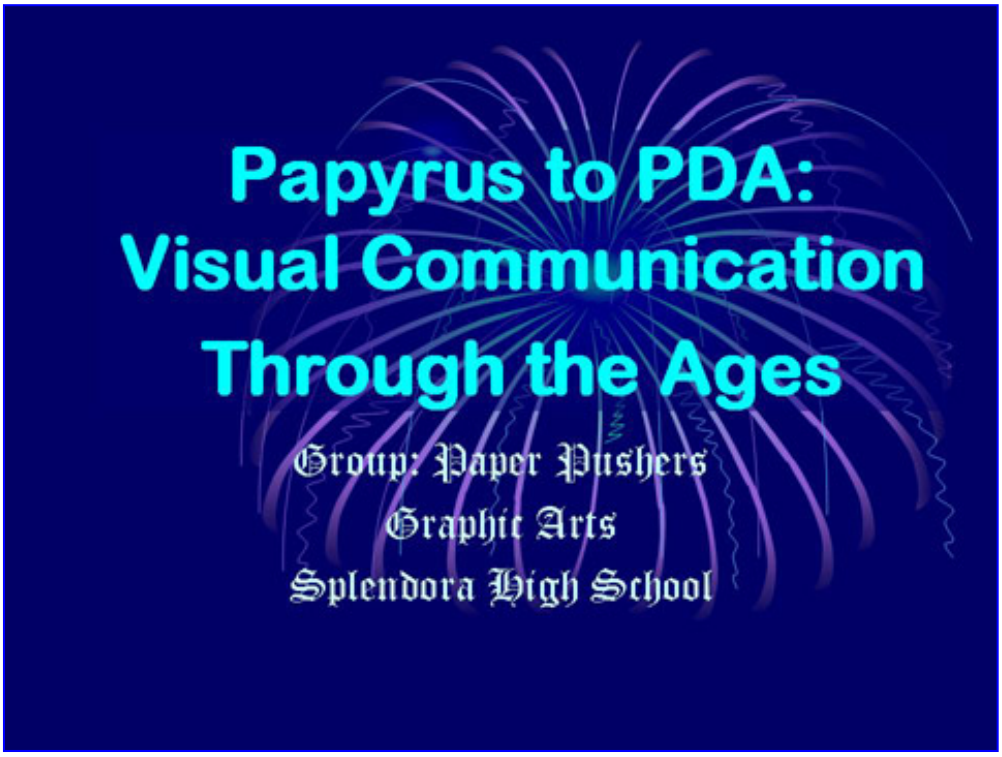

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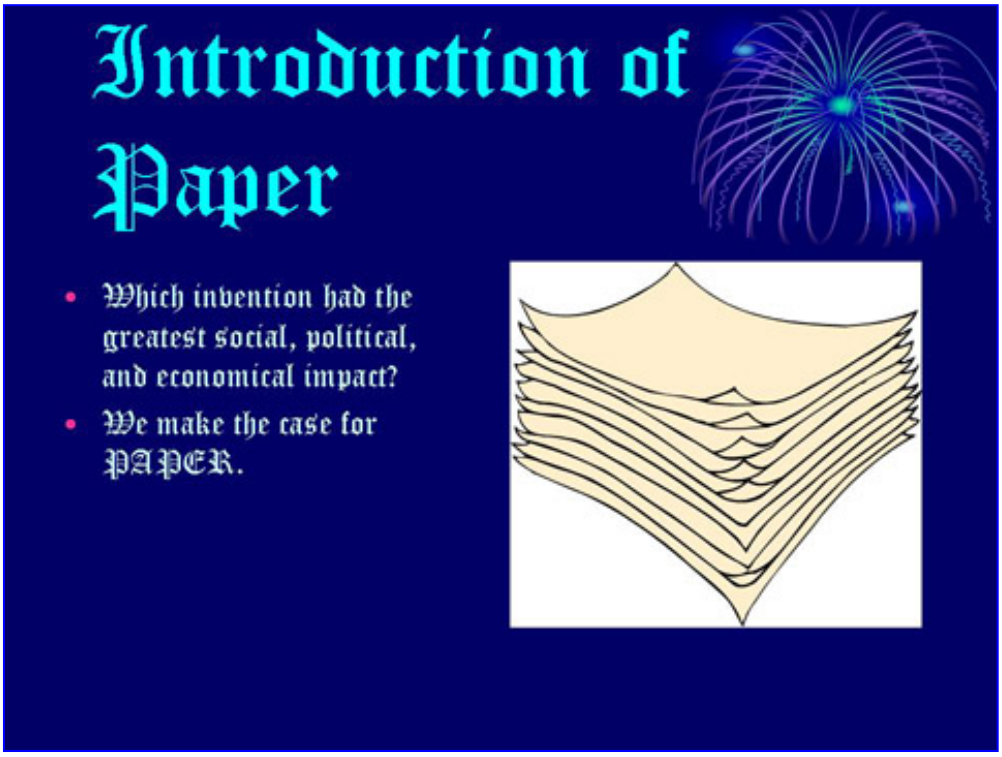

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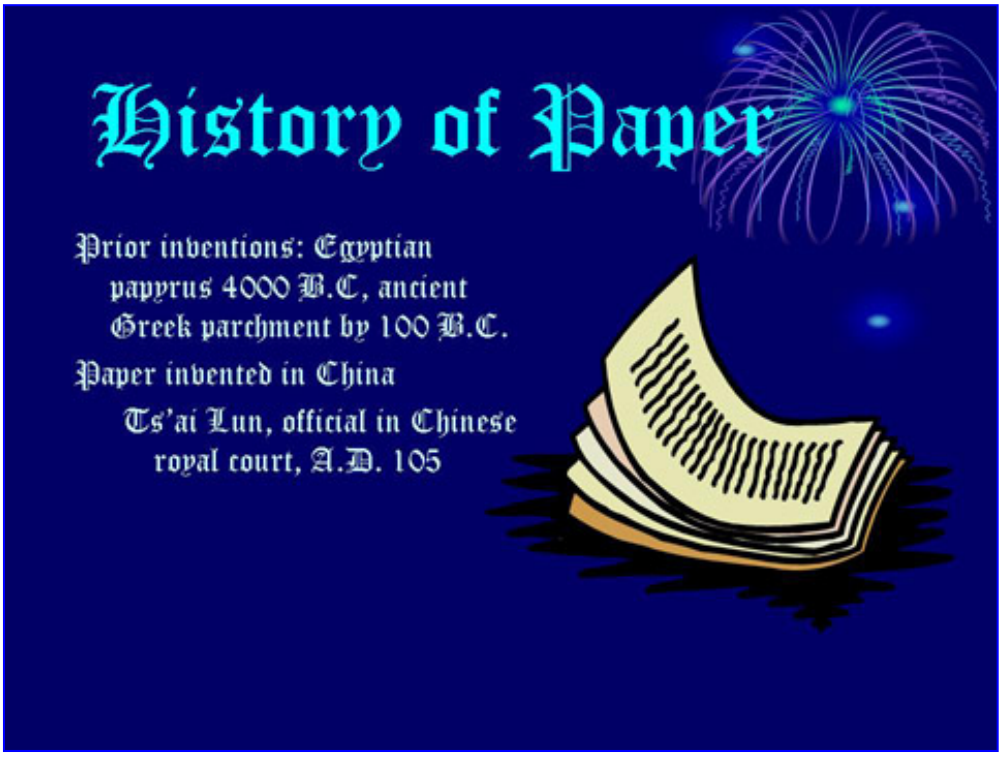

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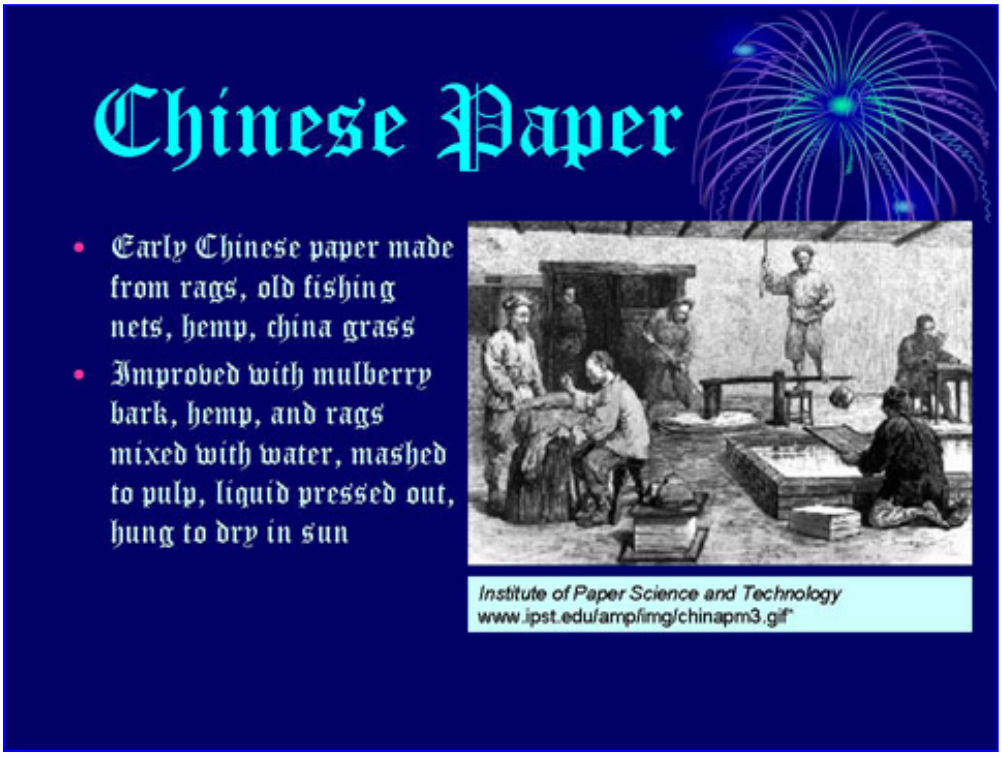

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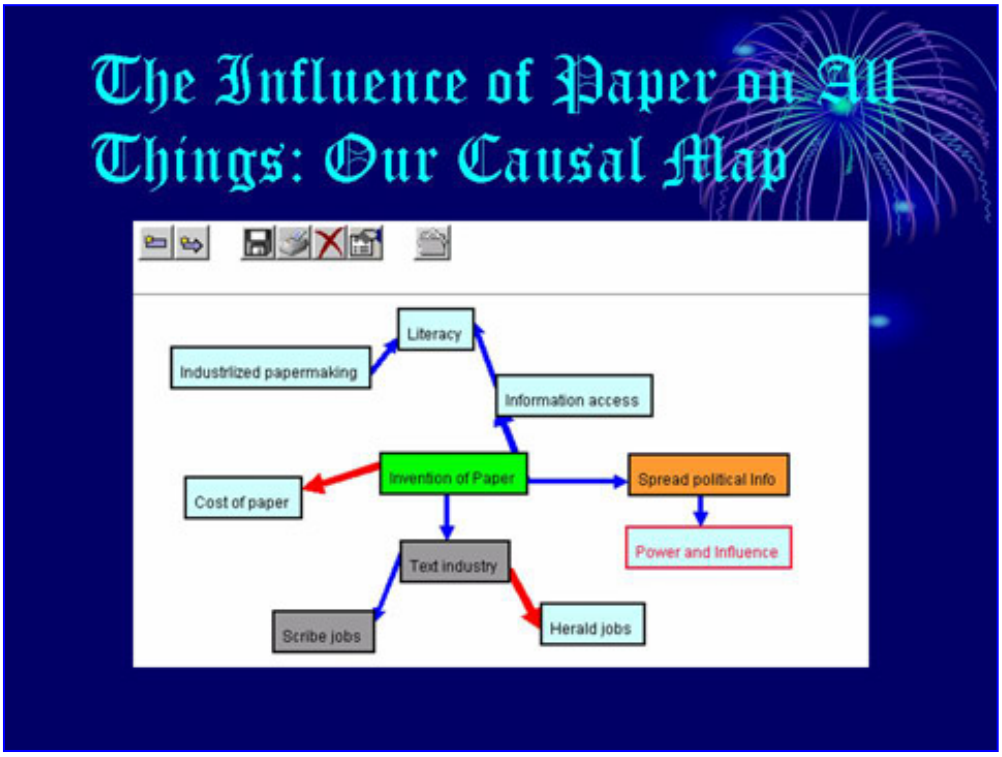

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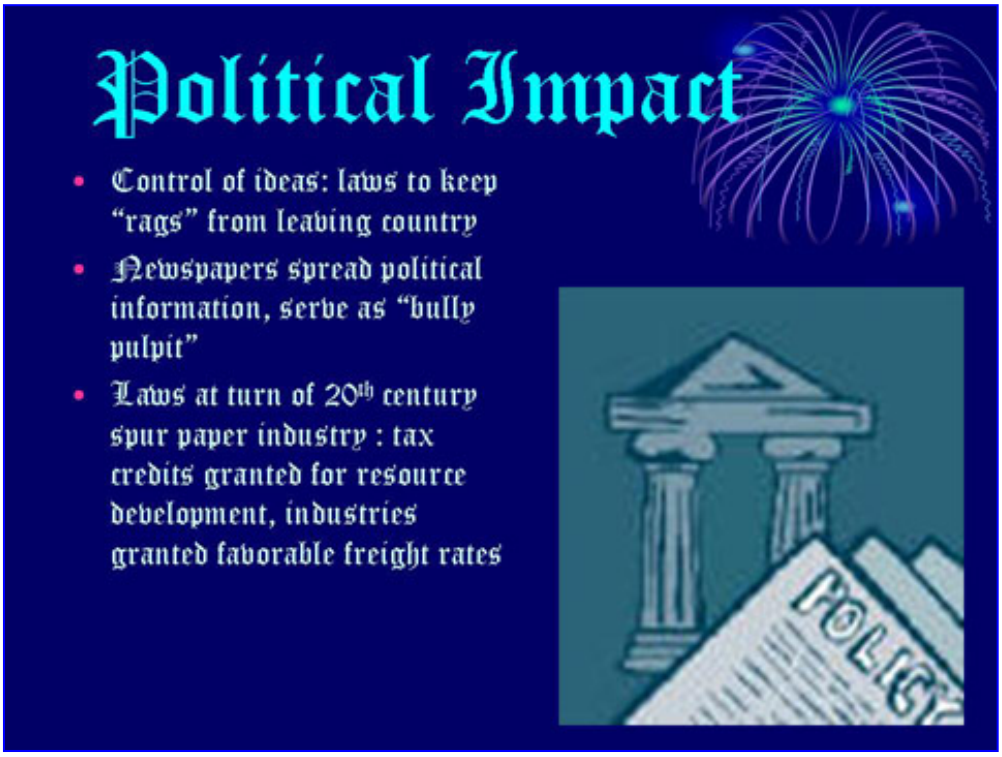

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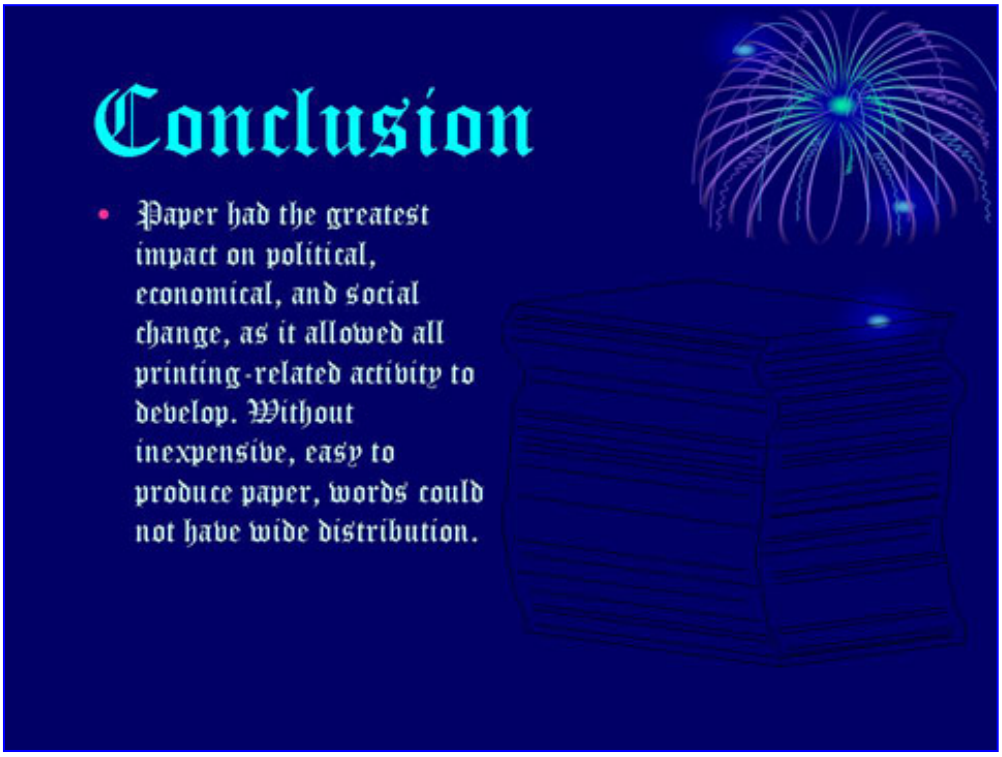

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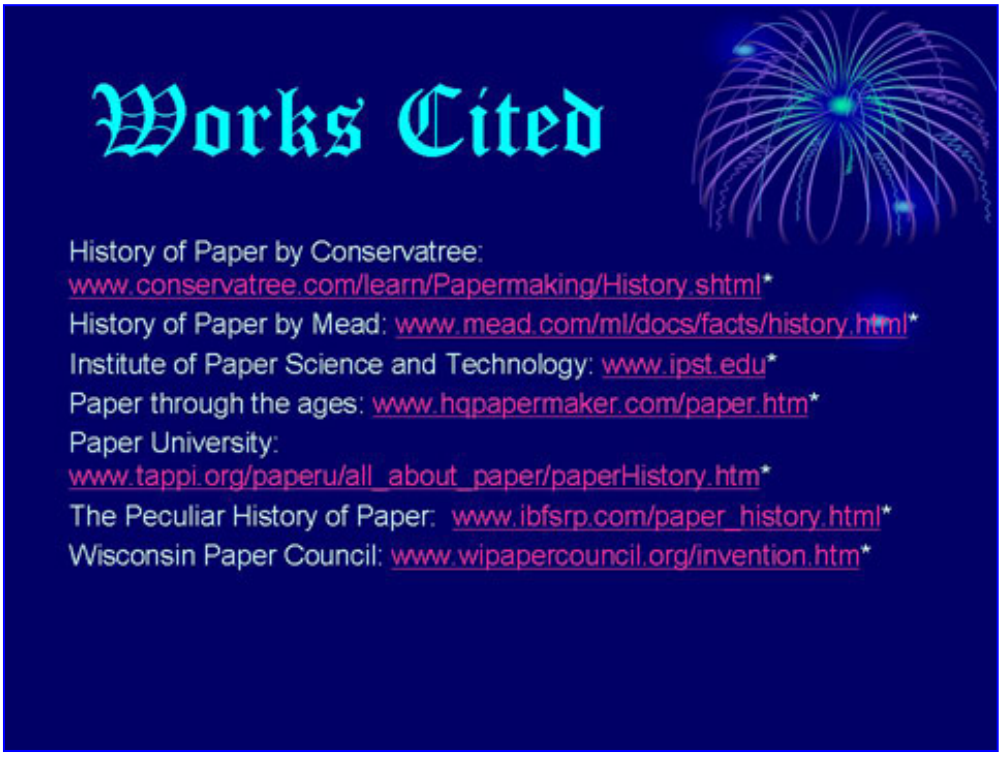

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Papyrus to PDA:
Visual Communication Through the Ages
Presentation Scoring Guide

Group Invention_____ Date_____

	TOTAL VALUE	YOUR SCORE	COMMENTS
Ideas and Content			
Demonstrates understanding of purpose (persuade and justify)	10		
Conveys clear, focused main ideas	10		
Effectively addresses and answers the unit question, *What invention in the history of visual communication has had the greatest impact on social, political, and economic life?*	10		
Includes enough factual evidence to support stance or prove case	10		
Uses visual(s) to depict cause and effect relationships that support and strengthen case	5		
Organization			
Displays a clear beginning, middle, and end	5		
Shows a clear sequencing of ideas and transitions	5		
Includes smooth and natural transitions between speakers	5		
Language			
Uses a variety of descriptive and accurate words appropriate to audience and purpose	10		
Incorporates the vocabulary of the discipline	5		
Delivery			
Communicates ideas effectively by maintaining eye contact, controlling speaking rate and volume, enunciating clearly, demonstrating oral fluency and vocal energy, and using appropriate gestures	10		
Shows evidence of practice	5		
Uses effective visual media, including slides, props, or handouts	10		
TOTAL POINTS **Final Grade:**	**100**		