

## Unit Plan

**Title:** Papyrus to PDA

**Description:** High school students study the question, How have inventions in visual communication impacted our life? Students use the *Seeing Reason Tool* to organize their ideas as they prepare to present and debate their reasoning.

### At a Glance

**Grade Level:** 9-12

**Subject Sort (for Web site index):** Science,

**Subjects:** Art, Science,

**Topics:** Graphic Arts, Inventions and Technology

**Targeted Higher-Order Thinking Skills:** Evaluation, Cause and Effect

**Key Learnings:** Progress of Print Technology, Impact of Print Inventions, Cause and Effect Relationships in Complex Systems

**Time Needed:** 12 1-hour class sessions

**Background:** [From the Classroom in Texas, United States](#)

### Unit Summary

High school students determine which invention in the history of visual communication has had the most profound impact on social, political, and economic life. Through research, activities, and discussions, students agree on inventions in print communication that have had great impact on human action or thought. Students then study one invention and use the [Seeing Reason Tool](#) to analyze and evaluate the impact of the invention. Students share their findings by developing a class presentation.

### Curriculum-Framing Questions

#### Essential Question

Why change the way things are?

#### Unit Questions

How are we changed by new technology?

How have inventions in visual communication impacted our 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 had on the world?

### Assessment Processes

View how a variety of student-centered [assessments](#) are used in the Papyrus to PDA Unit Plan. These assessments help students and teachers set goals; monitor student progress; provide feedback; assess thinking, processes, performances, products; and reflect on learning throughout the learning cycle.

## Instructional Procedures

### Prior to instruction

#### Setting up for Success

This unit makes use of the [Seeing Reason Tool](#). Familiarize yourself with the tool and its related materials, such as Walk through an Example, Classroom Strategies, Project Examples and Benefits. Follow the steps below to set up the workspace prior to working with your students.

#### Set up the Project

Build the project in the [Seeing Reason Teacher Workspace](#) following the steps provided:

- Project Name: Papyrus to PDA
- Project Description: After researching and studying one invention, use *Seeing Reason* to show the impact of this invention on social, political, and economic life. Revisit your map as you organize your ideas and prepare to present and debate the impact of your invention.
- Prompt for students: *How has one of the great inventions in visual communication impacted social, political, and economic life?*
- Assign teams to the project.

### Introduce the Project and Focus Efforts

Pose the Essential and Unit Questions, *Why change the way things are?* and *How are we changed by new technology?* Ask students to think individually about how technology has affected their lives. Have each student make a t-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. Guide a brainstorming session and have the class generate a list of great inventions in visual communication. Then, debate the relative merit for including each invention before reaching a consensus regarding which inventions are the most significant and should be included on the final list. Ask the Unit Question, *How have inventions in visual communication impacted our life?* Outline the scope of the project by reviewing the [project directions](#) with the students.

### Engage in Initial Research

Give the [research scoring guide](#) to direct students' efforts. Students select an invention to research from the class approved list. 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, with probing and clarifying questions, 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 *Seeing Reason Tool* presented in the next section.

### Guide Research Synthesis with the Seeing Reason Tool

Instruct students on the use of [Seeing Reason](#), and make a sample 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.

As students create their maps, pose the following questions (and similar questions) to help facilitate students' higher-order thinking and to articulate their reasoning between factors and relationships within the map:

- *How have you described this factor?*
- *How does this factor affect other factors?*
- *Would you please explain this relationship to me?*
- *Have you examined the question from different perspectives?*

### **Examine the Seeing Reason Activity**

The *Seeing Reason* space below represents one team's investigation in this project. The map you see is functional. You can roll over the arrows to read relationships between factors, and double-click on factors and arrows to read the team's descriptions.

#### **Project Name: Papyrus to PDA**

**Question:** *How has one of the great inventions in visual communication impacted social, political, and economic life?*

### **Develop Presentations and Debate**

As students complete research and synthesis, encourage them to revisit their *Seeing Reason* map and add additional factors or relationships. 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. Students will continue to follow the [project directions](#) 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 map screen shots or links in the supporting media.

Provide time for students to practice, using the [presentation scoring guide](#) as their standard. Encourage students to use props, reenactments, and other dramatic methods to strengthen their presentations.

On presentation day, 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. After the group presentations, have students complete a peer reflection on how well they worked as a group.

Prepare to debate the question: What invention had the greatest impact on visual communication? Give students time to organize, practice, and then present their arguments and counterarguments using a debate format. One member of the team will serve on a panel of judges while another member debates the issues. 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 to help students 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 affirmed your point view or influenced your change of opinion?*
- *How are we changed by new technology? Why?*

- *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

- Basic understanding of design
- Cooperative work skills
- Basic research skills, including note taking and citing references
- Basic computer skills,

### 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

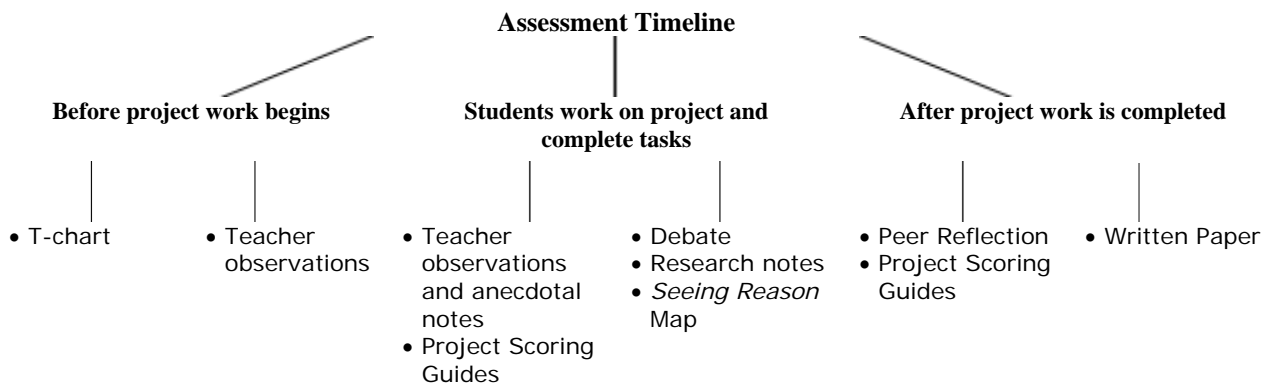
- Instruct the student to enhance the presentation by exploring the moral issues associated with the social and political changes brought about by each invention.
- Encourage the student to provide technical expertise in the development of the multimedia presentation, newsletter, or Web designs for the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

#### Assessment Plan



Throughout this unit the teacher makes observations and anecdotal notes to monitor and adjust student outcomes and progress. The teacher presents the [research scoring guide](#) to guide student work and grade individual research effort, group effort, and presentation plans. The [presentation scoring guide](#) is used to help students create their presentation and for the teacher to assess final presentations.

The *Seeing Reason* map shows how the students are thinking about their invention and informs the teacher if additional research is necessary. Upon completion of the project the students complete a peer reflection. If students write a paper about the next greatest invention, assess their written work.

### 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.

## THINGS YOU NEED

### Standards and Objectives

#### National Science Education Standards (NSES)

- Science in Personal and Social Perspectives  
Individuals and society must decide on proposals involving new research and the introduction of new technologies into society. Decisions involve assessment of alternatives, risks, costs, and benefits and consideration of who benefits and who suffers, who pays and gains, and what the risks are and who bears them. Students should understand the appropriateness and value of basic questions — "What can happen?" — "What are the odds?" — and "How do scientists and engineers know what will happen?"
- History and Nature of Science  
Content Standard G: In history, diverse cultures have contributed scientific knowledge and technologic inventions. Modern science began to evolve rapidly in Europe several hundred years ago. During the past two centuries, it has contributed significantly to the industrialization of Western and non-Western cultures. However, other, non-European cultures have developed scientific ideas and solved human problems through technology.

### Targeted Texas Content Standards and Benchmarks

#### Texas Essential Skills (TEKS): Graphic Communications

- Demonstrate knowledge of new and emerging technologies which may affect the field of graphic communication technologies.
- Demonstrate the principles of group participation and leadership related to citizenship and career preparation.
- 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
- Identify the advances in science and technology and the long-lasting effects on science and society.
- Make a supported argument

## Technology and Resources

### Printed Materials

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

### Technology—Hardware

- Digital cameras to take pictures for presentations
- Computer(s) for research and presentations
- Internet 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 software for presentations