

Analyzing Interactions in a Text

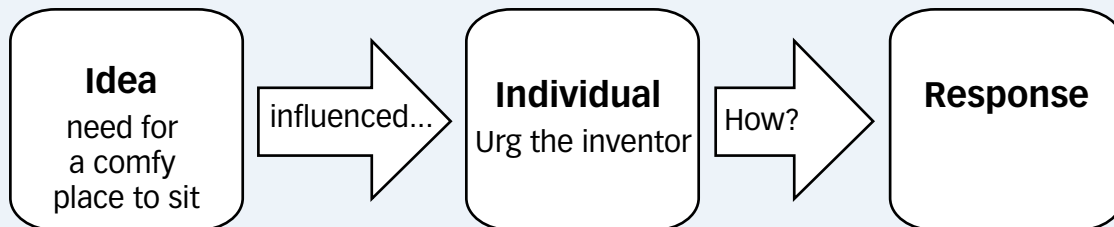
Theme: *Inventors and Inventions*

Why does an individual invent something new? Is it a response to a question, a dream, or a need? Most often, different factors work in combination to **influence**, or affect, the inventor.

Consider the events in the cartoon below. What effect does Ogg’s complaint have on his wife, Urg? What is her response? How do these factors result in a new invention?



Complete the chart below to show how the different factors in the cartoon are related.



The cartoon shows that a single idea influenced Urg, which led to her response. In contrast, consider an invention as complicated as the airplane. *Many* individuals, events, and ideas influenced the Wright brothers’ thinking and responses over the years. Ultimately, their invention was the result of a series of **interactions**, or the direct effects the factors had on one another. With your classmates, brainstorm the different factors that might have interacted to result in the invention of the airplane.

Throughout history, important outcomes result from the interactions among individuals, events, and ideas, and informational texts often explore these relationships. As a good reader, analyze the interactions carefully. Note how they shape the course and development of later events and ideas as well as the choices individuals make.



Read the first paragraphs of the historical account about the photographer Eadweard Muybridge.

Genre: Historical Account

Flying Horses by Cynthia Hernandez

Do horses fly? Intelligent, well-educated people were still asking this question at the end of the nineteenth century. Although the age of believing in winged horses had long since passed, people still wondered if a horse ever lifted all four hooves off the ground at the same time. If someone could prove that a horse’s hooves left the ground, then the answer would indicate that, yes, in a sense, horses do fly! Eadweard Muybridge, photographer and adventurer, put an end to years of speculation. Through the use of a new technology, photography, he laid the question to rest at last.

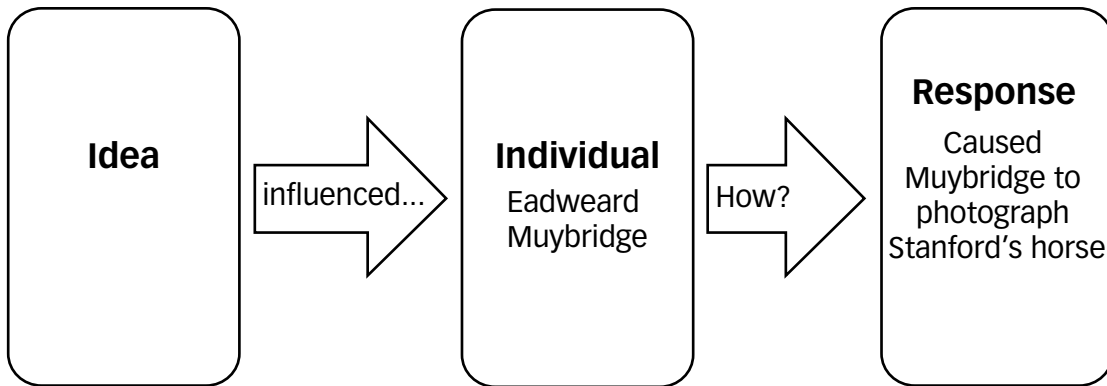
In 1872, Muybridge was working as a photographer in San Francisco when Leland Stanford, former California governor, hired Muybridge to photograph his racehorse. Stanford wanted to know if all four hooves of a trotting horse actually leave the ground, even for an instant. Muybridge rapidly hatched a plan. Unfortunately, his early efforts were unsuccessful.

(continued)

Explore how to answer this question: “What people, events, and ideas led to Muybridge’s plan to photograph a horse?”

Think of the way the question about horses influenced Muybridge’s actions.

Fill in the chart below with the idea that led to Muybridge’s response.



How did people, events, and ideas influence Muybridge’s plan? On the lines below, explain the interaction among the factors. Support your ideas with evidence from the text.



Close Reading

How did Muybridge’s ideas about photography and cameras help him figure out how horses moved? **Underline** the sentence that explains what his high-speed photographs revealed.

Hint

Which answer choice best describes the images caught by the cameras?

Continue reading about Eadweard Muybridge. Use the Close Reading and the Hint to help you answer the question.

(continued from page 28)

After several attempts, Muybridge finally succeeded in getting the proof Stanford needed. Muybridge set up a series of cameras in a line down the side of a horse track. As the horse passed by, its hooves snapped wires stretched across the track, which activated the camera shutters. A series of high-speed photographs resulted.

The results amazed the public. The photographs showed clearly that a trotting horse had all four hooves off the ground at the same time. The pictures were a sensation, and Muybridge became an international figure. His successful camera techniques led him to photograph other animal movements too fast for people to see.

Circle the correct answer.

Which sentence from the text best explains why the evidence provided by Muybridge changed the public’s thinking about horses?

- A** “Stanford wanted to know if all four hooves of a trotting horse actually leave the ground, even for an instant.”
- B** “Muybridge set up a series of cameras in a line down the side of a horse track.”
- C** “The photographs showed clearly that a trotting horse had all four hooves off the ground at the same time.”
- D** “His successful camera techniques led him to photograph other animal movements too fast for people to see.”



Show Your Thinking

Explain why the answer you chose illustrates the effect that Muybridge’s photographs had on people’s ideas about horses.



With a partner, discuss how Muybridge’s knowledge about the new technology of photography influenced events in his life as well as the thoughts and actions of others.



Read the historical account. Use the Study Buddy and the Close Reading to guide your reading.

Genre: Historical Account



I wonder how changes in England affected Eli Whitney in America. I'll have to read carefully to figure out how the interactions between events and ideas resulted in his response.

Close Reading

Why couldn't Southern states make money by growing cotton in 1792? **Underline** the sentence explaining the problem Whitney hoped to solve.

Underline clues in the text that show how Whitney's invention changed life in the South.

Eli Whitney and the Cotton Gin

by Timothy Morris

- 1 In the late 1700s, England was hungry for cotton. Until this time, women and girls of the family generally did the spinning and weaving. Then improvements were made to the spinning wheel and loom, making them faster and more efficient. As a result, the process became mechanized, and new textile mills opened to meet the growing demand for cotton cloth.
- 2 In America in 1792, Eli Whitney recognized that the mechanization of the cloth-making process meant a greater demand for cotton. Cotton grew easily in the Southern states, but the cotton bolls contained numerous small seeds that were difficult and time-consuming to remove by hand. Unless a more efficient way could be found to separate the seeds from the bolls, there was little money to be made in growing cotton.
- 3 As a young man, Eli Whitney liked figuring out things. He studied machines and often found ways to improve them. Whitney began to think about the problem of removing seeds from cotton and decided that a machine could be built to do the job efficiently.
- 4 The machine Whitney designed was simple, but it worked like a charm. Cotton was fed into a machine with short wire teeth on a revolving cylinder. The thin cotton fibers were pulled through, leaving the seeds behind. Now, a single machine was capable of cleaning and processing up to fifty pounds of raw cotton daily.
- 5 The invention of the cotton gin brought about many changes. The most significant effect was that, at long last, growing cotton could be profitable. Cotton plantations sprang up in the South where once empty fields stood, and textile mills opened to make cloth. Thanks to Whitney's invention, the world was never the same again. Just as mechanization revolutionized life in England, the cotton gin gave the American South a new industry to call its own.



Hints

Which choice explains the problem that the cotton gin was invented to overcome?

Which choice shows the effect that the cotton gin had on history?

How did Eli Whitney's cotton gin change people's ideas about growing cotton? What other changes came about as a result of the invention of the cotton gin?

Use the Hints on this page to help you answer the questions.

- 1 In America in 1792, growing cotton was not profitable. Which sentence from the text describes the problem as Eli Whitney understood it?
 - A "... women and girls of the family generally did the spinning and weaving."
 - B "... the process became mechanized, and new textile mills opened to meet the growing demand for cotton cloth."
 - C "... the cotton bolls contained numerous small seeds that were difficult and time-consuming to remove by hand."
 - D "... a single machine was capable of cleaning and processing up to fifty pounds of raw cotton daily."

- 2 Based on evidence from the text, which statement best describes how the invention of the cotton gin influenced later events?
 - A Eli Whitney made huge profits from the sale of cotton gins and became famous.
 - B The easy removal of cotton seeds from cotton made life better for the workers.
 - C Spinning wheels were no longer used due to the increase in cotton production.
 - D The cotton gin led to the growth of cotton plantations and the textile industry.

- 3 The passage tells how the mechanization of cloth-making in England led to changes in America. Explain how the interactions between people, events, and ideas gave rise to a new industry in the South. Support your answer with at least two details from the text.



Read the biography. Then answer the questions that follow.

Extraordinary People: Tim Berners-Lee

from HowStuffWorks online

1 Most people know that Thomas Edison invented the light bulb and that Alexander Graham Bell invented the telephone. But have you ever heard of Tim Berners-Lee?

2 Probably not, yet the work of Berners-Lee, the inventor of the World Wide Web, may have the most profound impact of all. Why is his name unknown to most of the world? The answer lies in the type of life he has chosen to lead and the role he has chosen to play in helping to guide this emerging technology.

3 If you were in a time machine and could travel back to 1960s London, you might find young Tim Berners-Lee busily constructing make-believe computers out of cardboard boxes or playing mathematical games with his parents at their kitchen table. Tim is fascinated by the world around him. His natural curiosity attracts him to a dusty Victorian-era encyclopedia he finds in his house; its mysterious title, *Enquire Within Upon Everything*, will stay with him for years to come.

4 Fast-forward to 2001. Over 250 million people are using the Internet, a system virtually unheard of 10 years earlier, and Tim Berners-Lee is largely responsible. How could one person make it all happen?

5 For some clues, let's go back to Tim's early adulthood. Tim was especially interested in two things: computers and how the human brain organizes and links information. He wondered how the mind can almost randomly connect so many different facts. For instance, how can a song or a scent mentally link or even transport someone to another time and place? Tim was so fascinated by computers that, before graduating from the University of Oxford, he built his very first one from a kit using a television and an early microprocessor.

6 In 1980, after graduating with a degree in physics, Tim went to work as a software engineer for an organization in Geneva, Switzerland. His job required a lot of research. He communicated with people all over the world and he was constantly answering the same questions over and over. He was frustrated by how poorly his mind could remember all of the reports and data he needed. He wished there were a way other people could simply access his data and he could access theirs via computer no matter where they were located.

7 Tim wrote a software program to help him keep track of important documents and, using a series of links (hypertext), he connected them together much like an index does in a book. He named the program Enquire after the book he loved as a child. In its original form, Enquire was capable of storing information and connecting documents electronically, but it could only access information on a single computer.

8 In 1989, Tim took a giant step towards his vision of a global system where documents could be linked via hypertext to the Internet, allowing people worldwide to easily share and link information. After much thought, he called his project the World Wide Web. Many people thought that connecting documents stored in individual computers around the world was impossible.

9 And even if it were possible, few of his fellow scientists thought it would ever become popular.



10 Tim was not discouraged. Working with a few colleagues who supported his vision, he developed the four critical foundations of the Web: The language for coding documents (HTML); the hypertext system for linking documents (HTTP); the system for locating documents on the Web (URL); the first graphical user interface (Internet browser). In 1991, the Web was launched and almost immediately, the Internet took off.

11 Although he has had many opportunities to do so, Tim has not profited from his creation. . . . [He] works for a non-profit organization located at M.I.T., a leading engineering university. Married with two children, Tim leads a good life, one that is full of professional challenges. He is pleased with the road he chose to follow. Today, he helps set standards and guides the Web's future, so he can be assured that it will remain open to all and not be splintered into many parts or dominated by one corporation. However, like Einstein, who was concerned with his role in the development of nuclear power, Tim believes that technology can be used for good or for evil. "At the end of the day," Tim says, "it is up to us: how we actually react, and how we teach our children, and the values we instill." To this day, Tim Berners-Lee works hard to see that the technology he invented remains accessible to all people around the globe. That, rather than instant wealth, is his reward.

1 This question has two parts. Answer Part A, and then answer Part B.

Part A

Based on the passage, which of Tim's early experiences **best** illustrates the need for a World Wide Web?

- A** He graduated with a degree in physics in 1980.
- B** His job as a software engineer was located in Geneva, Switzerland.
- C** While at college, he was very interested in computers.
- D** He became frustrated because he could not remember needed data.

Part B

Which sentence from the passage supports the answer in Part A?

- A** "Tim was especially interested in two things: computers and how the human brain organizes and links information."
- B** "Tim was so fascinated by computers that, before graduating from the University of Oxford, he built his very first one from a kit using a television and an early microprocessor."
- C** "He wished there were a way other people could simply access his data and he could access theirs via computer no matter where they were located."
- D** "Tim wrote a software program to help him keep track of important documents and, using a series of links (hypertext), he connected them together much like an index does in a book."



2 Tim Berners-Lee imagined a system in which information could be exchanged between computers. How did this idea influence his life’s work?

- A** It triggered his interest in building personal computers.
- B** It inspired him to develop the World Wide Web.
- C** It became the first step in building his own microprocessor.
- D** It encouraged him to publicly popularize his links to Enquire.

3 Based on the biography, explain how Tim Berners-Lee’s early childhood interests influenced the path he chose as an adult. Use at least **two** details from the text to support your answer.

4 Read these sentences from paragraph 5 of the biography.

He wondered how the mind can almost randomly connect so many different facts. For instance, how can a song or a scent mentally link or even transport someone to another time and place?

Describe what influence this idea had on Tim Berners-Lee’s approach to writing new programs that operate computers. Use at least **two** details from the biography to support your answer.

 **Self Check** Go back and see what you can check off on the Self Check on page 2.