



Test Your Printing Knowledge

At the close of the millennium, many groups viewed the accomplishments of the previous one thousand years and developed listings of the "most influential". Our vote went to the A&E television channel's choice for the #1 most influential person of the millennium – the inventor of movable type, Johannes Gutenberg.

Gutenberg's invention of the printing press is often credited as being the origin of mass communication – Western culture's first instance of being able to disseminate ideas and information from one source to a larger and more diverse audience. In the early 1450s, fast-occurring cultural change in Europe mandated the need for written documents, rapidly and cheaply produced. Gutenberg developed his press by combining features of existing technologies: textile, papermaking and wine presses. But his most significant innovation was the efficient molding and casting of movable metal type.

Curiously, Gutenberg's print technology did not change substantially until the 19th century. In the early 1800s, the efficiency of printing was advanced by the development of continuous rolls of paper, a steam-powered press and a way to use iron instead of wood for building presses. In 1884 the introduction of Linotype, a method of creating movable type by machine, resulted in a significant increase in production speed. Other typesetting technologies – photomechanical composition, cathode ray tubes (CRTs) and laser technology – furthered production efficiencies.

New printing technologies, including xerography, dot matrix impact printing and non-impact printers (inkjet, laser and thermal transfer) have provided a way to make printed documents available to audiences as large as millions or as small as one.

Given the importance of printing to human communication, it seems logical that we should all have a basic familiarity with the printing process.

Good luck - the answers appear on page 2.

- Where was paper invented?
 - Egypt
 - Spain
 - China
 - Polynesia
- From what material was the earliest paper made?
 - Bark
 - Bamboo
 - Silk
 - Cloth scraps and plant fiber
- What materials were used for type before Gutenberg's invention?
 - Clay
 - Bronze
 - Wood
 - All of the above
- Where was printing ink developed?
 - Egypt
 - China
 - North America
 - Italy
- Where was the first ink factory established?
 - England
 - France
 - Colonial America
 - Spain
- As used on a printing press, what is a blanket?
 - The large sheet used to cover it at night to keep it clean.
 - A full coating of ink.
 - A rubber sheet that transfers ink to the paper.
 - The mat beneath the press to reduce static discharges.
- What is process color printing?
 - Printing with inks that are machine processed.
 - Printing with more than one ink.
 - Printing that uses four inks to produce a full spectrum of color.
 - Printing with a special procedure in which each color is processed before the next is applied.
- In printing, the term trapping refers to:
 - Catching rats that would otherwise chew on the press blankets.
 - Catching paper in a small cage as it comes out of the press.
 - The slight overlapping of colored printing areas.
 - A new term for choking and spreading.

The Answers

1. Where was paper invented?
C. China. A Chinese named Ts'ai Lun is credited with the invention of paper in 105 AD. By the time Gutenberg was born, papermaking was a well-developed industry throughout the Western world with paper mills existing in Spain, France, Italy and Germany. The Chinese also led the world in making ink for printing.
2. From what material was the earliest paper made?
D. Cloth scraps and plant fiber. The invention of the printing press depended on the invention and refinement of paper. The Chinese developed "rag" paper, a cheap cloth-scrap and plant-fiber substitute for cumbersome bark and bamboo strips and for precious silk paper. In the 8th century, Chinese prisoners passed a mature technology on to their Arab captors; Europeans learned the secrets of papermaking in the 12th and 13th centuries.
3. What materials were used for type before Gutenberg's invention?
D. All of the above. Wood, hardened clay and bronze, though an improvement over hand scribing, were not durable enough to result in the production improvements of Gutenberg's movable type. In Gutenberg's method, each letter was carved into the end of a steel punch that was then hammered into a copper blank; the copper impression was inserted into a mold and the mold filled with a liquid alloy of lead, antimony and bismuth. The alloy cooled quickly and the resulting reverse image of the letter attached to a lead base could be handled in minutes.

4. Where was printing ink developed?
B. China. The origin of printing ink is mysterious. It was developed from writing ink used by the ancient Egyptians and Chinese. These early inks consisted of lampblack or soot mixed with animal glue or vegetable oils. The Chinese developed ink making to a highly developed art by introducing earth colors.
5. Where was the first ink factory established?
C. Colonial America. Ink making became a commercial process in the 18th century when the first ink factory was established in Colonial America in 1742. Prior to that time, the printer made his own inks with lampblack and boiled linseed oil. Each printer had his own secret formula for cooking the materials. Little color was used until the discovery of coal tar dyes in the middle of the 19th century.
6. As used on a printing press, what is a blanket?
C. The rubber sheet that transfers the ink to the paper. In an offset press, the blanket is wrapped around the blanket cylinder and receives the inked impression from the plate cylinder. In turn, the blanket transfers the image to the paper, which passes between the blanket cylinder and impression cylinder.
7. What is process color printing?
C. Printing that uses four inks to produce a full spectrum of color. The process ink colors are cyan (C), magenta (M) and yellow (Y). As each ink color is laid down on the sheet, about one-third of the visible spectrum of color being reflected off the white paper is subtracted. The primary process colors also create sec-

ondary colors and overprints. Black ink (abbreviated K) represents the total lack of colors; it is used to create contrast.

8. In printing, the term trapping refers to:
C. The slight overlapping of colored printing areas. Trapping prevents white lines from appearing along the edges of the different colored areas by allowing for possible minute shifts in ink lay-down.

Helpful Vocabulary Words:

Continuous tone: A range or gradation of tones in black and white or color in a photograph or illustration. The tones are no tone, quarter-tone, halftone, three-quarter tone and total density.

Dot: A single area of a printing surface necessary to reproduce a continuous tone image on a printing press. Needed because printing presses have the ability to print only one color and one color density at a time. The traditional dot shape is square; other shapes are elliptical or round.

Dummy: A folded sample used to show finished size, shape and binding requirements.

Fountain solution: A water, natural or synthetic gum and chemical solution used to dampen press plates so non-printing area will not accept ink.

Halftone screening: A geometric dot pattern of varying size that creates an optical illusion of tone gradation.

K: In process color printing, the abbreviation for black ink. The K stands for key printer, the printing plate that carries the text copy or key-line information.