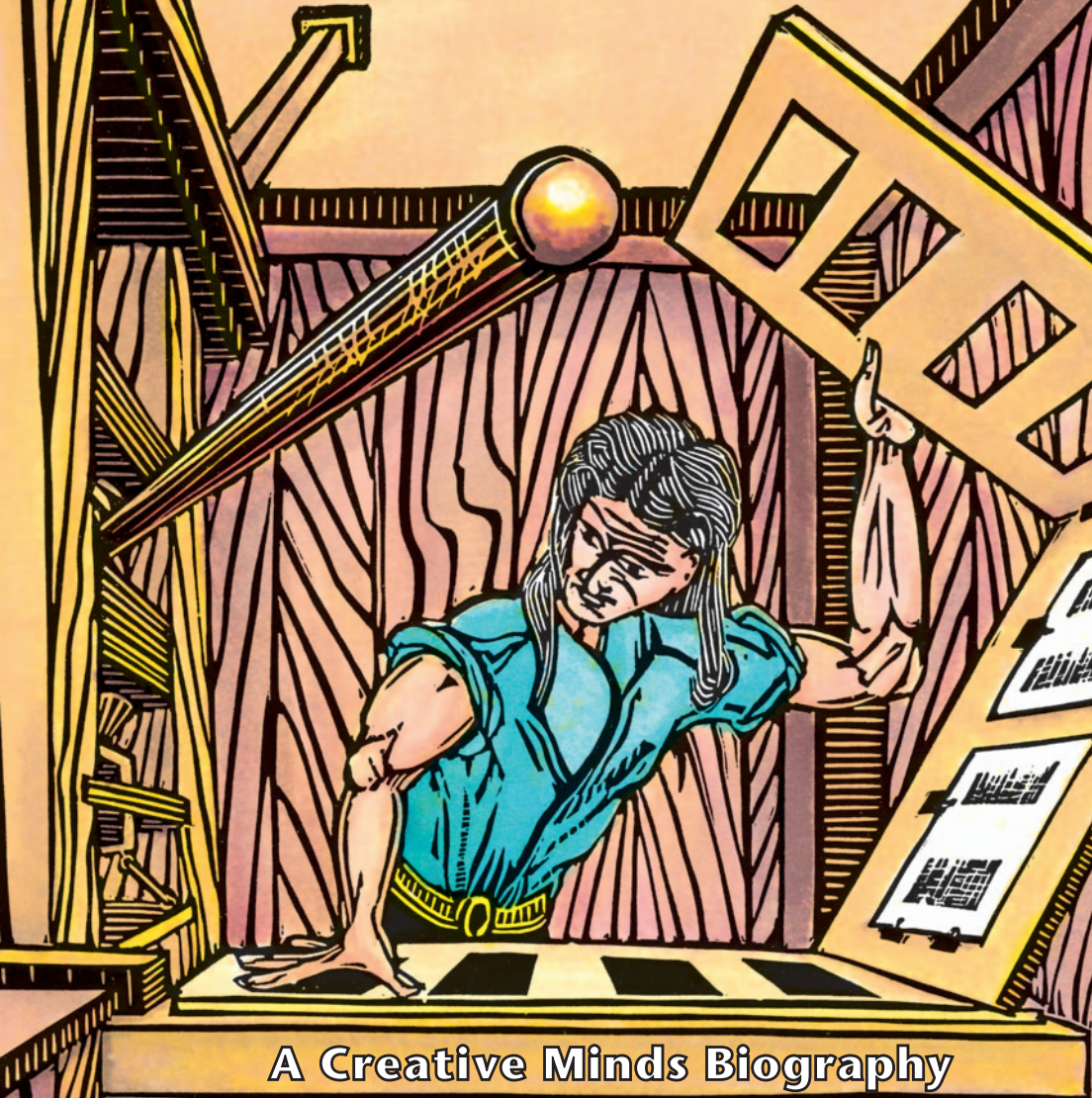


Fine Print

A Story about Johann Gutenberg
by Joann Johansen Burch
illustrated by Kent Alan Aldrich



A Creative Minds Biography



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FINE PRINT

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M Millbrook Press/Minneapolis

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Kent Alan Aldrich created the original artwork for this book by carving his designs by hand into linoleum blocks. The linoleum cutting process is similar to that used for book illustrations in Johann Gutenberg's time when designs were carved into blocks of wood.

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Author's Note

Writing a book on the life of Johann Gutenberg is not easy, because few facts are available. No one knows exactly when he was born or when he died. Writers and historians must become detectives to gather information on his life.

Histories written after his death tell conflicting stories about how Johann invented printing by machine. Court records from the 1400s can help us figure out how he developed his invention. Johann was involved in a number of lawsuits, and the testimony of witnesses tells his story. Sometimes the testimony can be very dramatic, as when Andreas Dritzehen, one of Johann's partners, argued with his neighbor. At other times, the testimony stops just short of telling us important facts about Johann and his work.

Today the Gutenberg Bible, the first book ever printed in the Western world, is one of the world's treasures. And Johann Gutenberg is remembered as the man who gave us the gift of printed books.

New Terms

adjustable mold: A small wooden box with one side wall that moves to adjust for letters of different widths. A block of metal called a matrix slips in to form the bottom of the box. Hot liquid metal is poured into the top to make a piece of type.

apprentice: Someone who works without pay for a more skilled worker in order to learn a trade.

binder: A person who sews the loose sheets of a book together and binds them between wooden boards covered with cloth, leather, or other materials.

chronicles: Histories or stories that tell of important events in years past and speak of famous people and the great things they have done.

guild: A group of people who make and sell things. Guilds protect their members and make sure they produce high-quality goods.

gulden: A unit of money used in medieval Germany.

illuminator: An artist who decorates books with borders and small paintings.

manuscript: A book written out by hand.

matrix: A model of a letter. A matrix is made by striking a punch into a small bar of metal. The punch leaves the shape of a letter in the metal bar.

medieval: Belonging to the Middle Ages, a period of time from about the year A.D. 500 to the late 1400s.

monastery: A building where monks, priests, and other religious persons live.

movable type: Sticks of metal only a few inches long with a raised letter of the alphabet on one end. Type can be arranged and rearranged in different combinations to form words. The letter on the end of a piece of type is backward. Only when ink is applied and paper is pressed against type, will it “read right,” or look like the letters on this page.

parchment: Animal skin from a calf, sheep, or goat that is soaked, stretched, and scraped until smooth enough to write on.

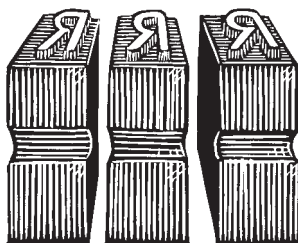
pilgrims: People who travel to an important religious place to ask a special favor of God.

punch: A steel bar with a raised letter carved into one end. Punches are used to make a model of a letter or a matrix. A punch, like a piece of type, reads backward.

rubricator: A person who writes chapter titles and section headings in red in a book to make them stand out from the black letters of the text.

scribe: A person who makes a living from copying books by hand.

vellum: A fine parchment made from the skin of a newly born calf, lamb, or goat.





1

A Long, Cold Winter

During the winter of 1410–1411, twelve-year-old Johann Gutenberg grew restless. He couldn't play outside while snowstorms swirled around his house. He couldn't walk through the forests at the edge of town with snow piled high against the trees. Sometimes he couldn't go to school with his friends, when icy winds froze everything in their path.

Fortunately there were books in his home, and Johann knew how to read. After he read all of his father's books, he borrowed others from his parents' friends. The nearby monastery also had books he could read, although the most precious ones were chained to reading tables.

Not that Johann would have wanted to take the monastery's books home to read. Most books in the 1400s were about religion, philosophy, law, and other similar topics. Six hundred years ago, there were no books written for children. But good stories could be found in books. When Johann's older brother Friele was too busy to play chess or backgammon, and his sister Else was doing needlework, he could find good company in the history books and chronicles in his father's library. Chronicles told of important events in years past and spoke of famous people and the great things they had done. After Johann was much older, chroniclers wrote about the winter of 1410–1411 and the town of Mainz.

Johann, his brother, sister, father, and mother lived in Mainz, where they were born. Nowadays Mainz is a city in Germany. In the 1400s, Mainz was part of the Holy Roman Empire, which included small kingdoms and towns stretching from Germany to northern Italy. Mainz was an important trading town on the Rhine River. Traders came up the river from all parts of Europe and beyond. Johann's parents bought expensive things such as glass from Italy, spices from China, and beautiful books from Germany and beyond.

The books were called manuscripts from a Latin word meaning “written by hand.” All books were copied down with pen and ink, letter by letter. Manuscript books sometimes took a long time to make and could be very expensive. Six hundred years ago, a luxury book might be worth as much as a good-sized farm.

Besides buying books from traders, Johann’s father paid local copyists, called scribes, to copy texts by hand. When the text was finished, the scribe handed the buyer a set of loose sheets covered with neat handwriting. The loose pages were made of calf-, sheep-, or goatskins called parchment or vellum. The skins had been soaked, stretched, and scraped until they were smooth enough to write on.

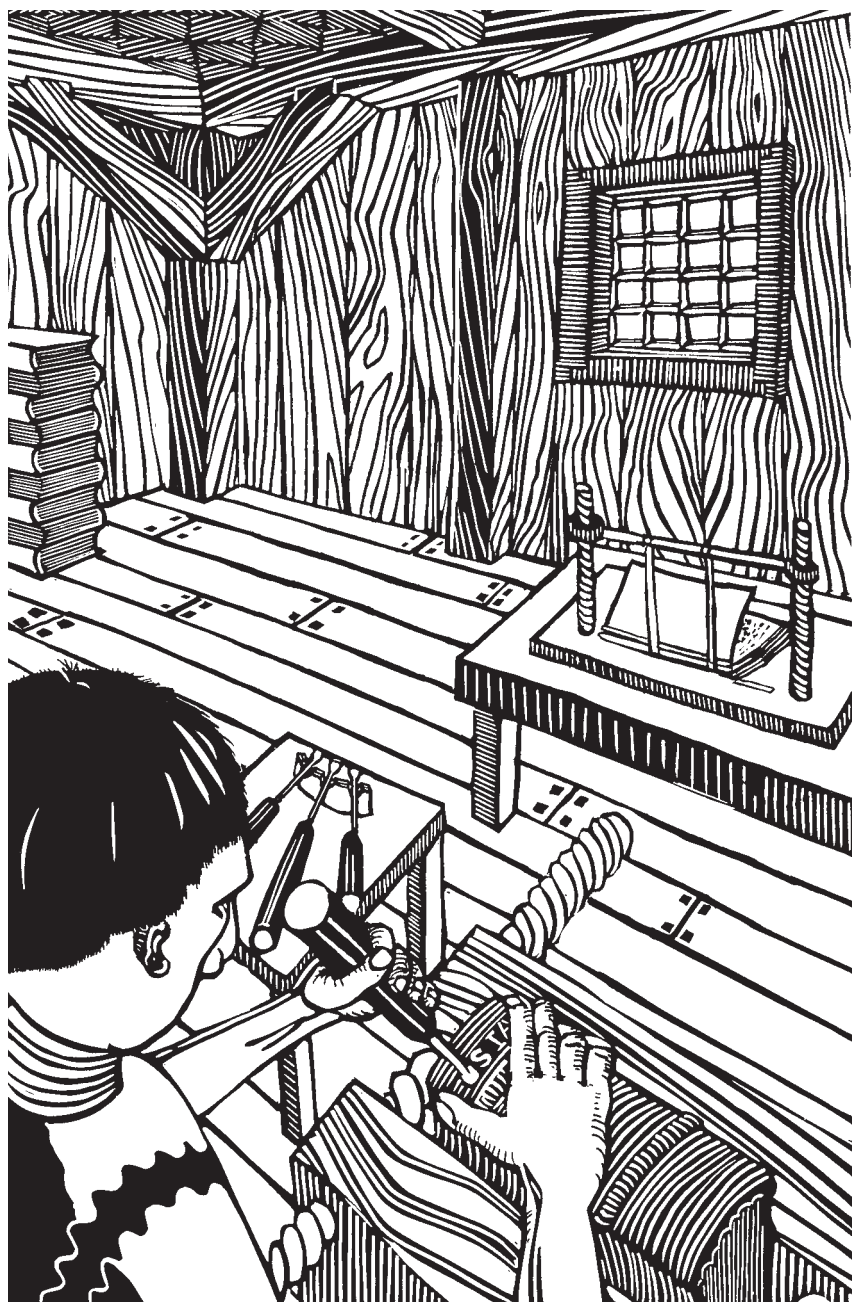
Before the sheets of parchment became a book, many more craftspeople did their work. Johann, anxious to read every new book his father ordered, followed each step. The loose sheets first went to the rubricator, or “red inker.” The rubricator wrote chapter titles and section headings in red to make them stand out from the black letters of the text. Sometimes the rubricator also put a red line through the first letter of each sentence.

Parchment was so expensive that none of it could be wasted. If any space was left at the bottom of the page, a new chapter started right after the one before. Since every inch of space was used, the rubricator's work helped readers find their place on the page.

Next, Johann's father might give the pages to an artist called an illuminator. Illuminators decorated the margins with miniature scenes, geometric designs, or borders of leaves and flowers. For more expensive books, illuminators painted brightly colored pictures or giant letters at the beginning of each chapter. On the most precious books, thin sheets of gold leaf were applied to make the pages shine.

The final step was a trip to the bindery. The binder sewed the loose sheets of parchment together and bound them between wooden boards. At the bindery, workers also covered the boards with cloth, leather, or perhaps even gold, silver, and carved ivory. For fancier leather covers, the title of the book was stamped on, one letter at a time, with brass punches.

Johann grew impatient waiting for books to be finished. He wished for a faster way to make them. A scribe spent weeks copying a book.



Then, by the time the rubricator, illuminator, and binder did their jobs, several months might pass. There must be a better way, Johann thought, and someday he would figure it out.

In the meantime, he had other things, like school, to think about. Johann's father saw to it that he and his brother received a good education. At that time, boys like Johann went to schools run by the Catholic church. In school priests taught them their most important subject: Latin. During school hours, students and teachers read and spoke only in Latin. It wasn't easy to study grammar, geography, or arithmetic in a foreign language!

At school Johann used the name Gutenberg, even though his brother and the rest of his family were called Gensfleisch. The Gensfleisch family was a large one, and several men in Mainz were named Johann Gensfleisch. Johann may have preferred being called Gutenberg, or "good hill," to Gensfleisch, which means "goose flesh."

Johann took his name from Hof zum Gutenberg, one of the three mansions his family owned. *Hof* in German means "court." Large medieval houses like Hof zum Gutenberg were often V-shaped with an inner courtyard. The rooms

around the courtyard had doors and glass windows to let in light and air. On stormy winter days when he couldn't go outside, Johann read beside the windows. They gave better light than the flickering wax candles he lit at night.

Most houses in Mainz did not have glass windows or wax candles for lighting. They were dark and smoky places. In the daytime, some light came in through narrow windows covered with oiled cloth. But at night and during cold weather, wooden shutters closed out any natural light. Since candles were expensive, the glowing fire in the fireplace was often the only source of light. People cooked meals in the fireplace, and smoke drifted around the room. Sometimes it was hard to breathe, and the walls became covered with black soot.

Hof zum Gutenberg did have one thing in common with other houses in Mainz: no indoor plumbing. This meant no bathroom was inside. Johann and his family used an outhouse in the backyard. In colder weather and at night, they used indoor pots which had to be emptied often. There may have been a steam room in the basement of Hof zum Gutenberg for bathing. If not, Johann would have gone to a public or private

bathhouse, as everyone else did in Mainz.

On his way to the bathhouse or to school, Johann walked down narrow, twisting streets. Rows of houses lined the streets, and many had shops on the ground floor. The buildings were narrow and tall, sometimes three and four stories high. To gain more living space, each story stuck out a little beyond the one below. Upper floors jutted over the street, and houses opposite each other almost met above Johann's head.

All through the winter of 1410–1411, snow piled up on the high-pitched roofs and then crashed down to the streets below. Even with the snow and cold weather, Johann could smell the garbage tossed into the gutters. Pigs and chickens running loose through Mainz ate some of the litter, but there were always piles waiting to be cleaned up. If he was unlucky, Johann stepped in a pile when he wasn't looking. And on very unlucky days, he might even get a shower from dirty water thrown out of an upstairs window.

Johann passed by many of the shops lining the streets of Mainz. These shops were run by guilds. In the 1400s in Europe, there were craft guilds and merchant guilds. Men and women who made things to sell were members of the craft guilds.



These included jewelers' guilds, weavers' guilds, carpenters' guilds, and many others. Many of the more successful townspeople belonged to merchant guilds. They handled the town's trade. Merchant guilds also supplied craft guilds with the raw materials they needed. Jewelers' for example, bought gold through merchant guilds, and weavers bought dyes.

The men in Johann's family were not guild members. They had inherited money and property and did not need to work. However, many of them did work, especially in the town's government. Johann and his family were members of a group of high-ranking families known as patricians. They had lived in Mainz for many years and were very powerful. The patrician families operated the mint, which made the town's money. The mint was also in charge of collecting taxes to run the town's government.

Collecting taxes was not popular. During the winter of 1410–1411 patricians were becoming very unpopular with the guilds of Mainz.

Johann's father was one of the patrician members of the Mainz town council. Guild members could be on the council too, but there were always more than enough patricians to give them

control of Mainz. People in the guilds wanted more of their members on the council. They had been angry for a long time about high taxes the council put on beer, wine, and grain.

In early 1411, times were bad for many Mainz citizens. Most people had not earned enough money to keep their families fed and warm during the long, cold winter. That spring, the council voted to raise taxes. Guild members were angrier than ever before. Their families were hungry, and the government wanted even more money from them. The guilds had had enough. They stormed into the town hall, threw out the patricians, and took over the Mainz town council.

Johann's father was horrified. Mainz would be ruined. Guilds had no experience in government. Many members could barely read and write.

The patricians, including Johann's father, lost their jobs at the mint. To make matters worse, they were insulted as they walked down the street. Guild members jeered at Johann too, even though he was only thirteen. By late spring of 1411, Johann's father was fed up with life in Mainz. He moved the family to Eltville, seven and a half miles away, where they owned a home in the country.



2

Finding a Way

Johann spent three years in Eltville, away from the feuds, noises, and smells of Mainz. Finally in 1414, guilds and patricians made their peace. The Gensfleisch family moved back to Hof zum Gutenberg.

Johann's father could once again collect rents on his town properties. Although he got his old job back at the mint, he did not become a member of the town council again.

Now that Johann was sixteen years old and finished with school, he worked with his father. He had spent time at the mint as a boy and was fascinated by everything that was made there. Besides coining money for Mainz, the mint made government seals and other gold and silver objects such as jewelry and picture frames. Always curious about how things worked, Johann learned all he could from the goldsmiths and jewelers at the Mainz mint.

Goldsmiths belonged to one of the most important craft guilds in town. They served a long apprenticeship. Apprentices lived in the home of a master craftsman. They worked without pay for several years while the master taught them a trade. Since Johann was a patrician, he did not have to begin as an apprentice. Patricians were not part of the guild system.

Besides learning how to make coins, Johann made gold and silver jewelry. An important part of jewelry making is cutting and polishing precious stones. A jeweler cuts gems into facets, giving them many sides, so that light reflects off each one. A well-cut jewel shines brightly. Johann practiced on his family's jewels until they sparkled.

Learning to create objects such as coins and jewelry gave Johann an idea. He remembered how bookbinders used small brass punches to stamp letters onto the leather covers of manuscript books. Maybe he could use that technique to find a faster way to make books. Such an invention would give the world more books, something Johann had been dreaming about ever since he had learned how to read. It could also bring him a lot of money. Johann decided to find a way to make his idea work.

His idea was to make separate metal letters and arrange them into words. By setting up a whole page this way, he could print as many copies of a page as he wanted. Johann began to experiment. First he tried to sand-cast metal letters, the way he sand-cast jewelry.

For his jewelry, Johann made a wax model of the piece, just the way he wanted it to look. Then he filled both halves of a box with fine, damp sand. This was his casting box. Johann laid the wax model on top of the sand in one half of the box. Then he closed the other half around the model. When he opened the box and took out the model, its shape was left in the sand. Closing the box again, Johann poured melted metal down a hole into the empty shape. After the metal cooled, he had a copy of the model.

Sand casting did not work very well with letters. Johann went through all the steps for making jewelry. But when the metal hardened and he lifted the letters from the sand, they were so imperfect he had to rework them with a knife.

Johann was even more disappointed when he lined up the metal letters to form words. He spread ink evenly over the letters, put a scrap of parchment on the inky surface, and pressed hard

so the letters would press onto the parchment. But no matter how careful he was, the letters came out crooked on the printed page. Not only that, if one letter was just a hair short, it wouldn't get enough ink and would print lighter than the others. Sometimes even parts of the same letter didn't print evenly. He had to find a better way to make his idea work.

Johann's father died in 1419, when Johann was twenty-one years old. Although he received money every year from rents on the properties his father had owned, he continued to work at the Mainz mint. And he still spent most of his spare time working on printing experiments.

When a papermaking shop opened in Mainz, Johann paid a visit. Six hundred years ago, paper was made by hand out of cloth rags. Papermakers beat rags and water to a pulp in large vats. Then they dipped screen-covered molds into the vats to scoop out the paper pulp. After each dip into the vat, a soggy new sheet of paper was transferred onto a piece of felt. Layers of felt and paper were stacked in piles. Others were squashed tight in a press. Each time the papermaker turned a huge wooden screw, the press forced more water out of the paper.



The paper press may have given Johann an idea: What if he could make a press that would squash a single piece of paper against words made from his metal letters? If he put ink on the letters, the force of the press would print the words right onto the paper. No more pressing parchment against the letters by hand as he had done in his earliest printing experiments. A wooden press would be faster and would print more evenly than he had been able to print before. It just might work.

Before Johann could try out his new idea, another wave of trouble with the guilds broke out. In 1428, the guilds took over the town council by force once again. Many patricians were not allowed to own property in Mainz. Others were told to leave town.

Johann was one of those who had to leave. He was tired of guild revolts anyway and decided to move. He would go to Strasbourg, one hundred miles down the Rhine River from Mainz. With the money his father had left him, he could spend all his time trying to make his printing experiments work.

3

A Secret Workshop

Johann had heard that people in Strasbourg liked books as much as he did. He knew Strasbourg had a cathedral, with a library full of fine books. A city where others were interested in books and learning would be a good place to work on his printing experiments.

After three days riding his horse through thick forests, Johann reached the walls surrounding the city. Guards at the main gate checked his traveling

papers and let him in. He was surprised to see how modern Strasbourg was. The streets were paved with stones. Merchants, clerks, and servant girls walked about. Workmen on high scaffolds were adding a new spire to the cathedral.

Johann settled into a room at an inn and explored Strasbourg. The Gensfleisch family was well known even outside of Mainz, and it was easy for Johann to meet people. But he was not interested in making a lot of friends. He wanted to find a workshop so he could continue his experiments.

When Johann saw the area around the old monastery of St. Arbogast, he knew he had found the perfect place. St. Arbogast was a quiet neighborhood just outside the city walls. Here, Johann would be able to keep his many printing experiments a secret.

Six hundred years ago, trade secrets were closely guarded. Bakers refused to share recipes. Jewelers kept their techniques to themselves. Goldsmiths never revealed to outsiders how they melted and shaped metals. But Johann had learned goldsmithing secrets at the Mainz mint. By using these methods, he thought he could invent a way to produce books not by hand but with metal letters and a press.

Johann set up his workshop in a building in St. Arbogast. He spent long hours working alone, asking for help only when it was absolutely necessary. For his experiments, he needed large quantities of metals. Only a guild member could get them for him, so Johann asked Hanns Dünne, a Strasbourg goldsmith, for help. He paid Hanns one hundred guldens for the metal—enough to buy a house in town or even a farm. Johann was going to make his ideas work, no matter what the cost.

He was still working at his experiments when a messenger came from Mainz three years later. The messenger told Johann that the new government of Mainz would let him return. But Johann didn't want to go back. That would mean moving his workshop, and he had made progress in quiet St. Arbogast.

It wasn't until 1433, five years after his exile, that Johann returned to Mainz. He went back for his mother's funeral, but he didn't stay. With the inheritance from his mother, added to what his father had left him, Johann had enough to buy all the materials he needed . . . he thought.

Back in Strasbourg, Johann heard some bad news. The Mainz town council said he had to move back if he wanted to keep receiving his

When Johann Gutenberg was a child in the early 1400s, books were rare and sometimes very expensive. Each book had to be copied by hand, letter by letter. Gutenberg loved to read, and he often grew impatient waiting for the time-consuming bookmaking process to be completed. Young Gutenberg dreamed of finding a better way to make books. From his childhood in strife-torn Mainz through the many years of setbacks and bankruptcies, Gutenberg persevered in his belief that books could be made quickly and inexpensively. This is the story of the man who invented movable type and the printing press and gave the world the gift of books.

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