

## Inventions of the Renaissance

### **Clocks**

The first mechanical clock was invented in the early 1300's. With this invention time began to be measured in hours (24 hours equaling a day).

Galileo, an Italian scientist, discovered the pendulum in 1581. The pendulum greatly improved the constant movement of the hands or bell of a clock. The average error with the pendulum varied only by seconds each day. Before this the error was from 10 to 15 minutes a day.

During the 1600's the metallic gear, or toothed wheel, and the use of the screw in assembling the clocks were first used.

### **Eyeglasses or Spectacles**

Historians are not certain who invented the first spectacles. In the late thirteen century around 1287 paintings first appeared with people wearing or holding spectacles. From these paintings we know that spectacles were invented in Italy.

Around 1300 the Venetian Glassmaker's Guild made regulations on glasses. They made it illegal for glasses to be made with glass lenses in place of the more valuable rock crystal.

In 1352 eyeglasses were only worn by the well educated, very rich noblemen or well read Italian clergy. At this time a monk named Tommaso da Modena documented the church had painted a fresco with an older churchman wearing glasses while looking over an old manuscript.

In 1456 Gutenberg invented the printing press. This created a widespread of books. Once people owned books reading glasses began to be seen in the hands of the common people. These glasses were made with a variety of materials including wood, lead, copper, bone, leather, and even horn.

In 1623 the Spanish invented the first graded lenses. This improved the trial and error method of trying on different lenses until one pair helped the wearer to see better.

### **Flush Toilet**

Sir John Harrington, godson to Queen Elizabeth, made the first flush toilet for himself and his godmother in 1596. He was teased by his friends and never made another one although he and Queen Elizabeth continued to use the one he did make.

Two hundred years later Alexander Cummings reinvented the flush toilet more commonly called the water closet. Cummings invented the strap. The strap was a sliding valve between the bowl and the trap.

Two years later in 1777 Samuel Prosser applied for and received a patent for a plunger closet. A year later Joseph Bramah invented a valve at the bottom of the bowl that worked on a hinge.

## **Gunpowder**

Gunpowder was invented around 850 A.D. The Chinese used gunpowder in the early 1230's to launch fireworks and in weapons.

Gunpowder was probably used for the first time in Europe during the Battle of Crécy in 1346. Historians do not know if this invention was carried from China to Europe or if The Europeans invented it independently.

The invention of gunpowder greatly changed the way men fought. The Medieval knight could not defend himself against firearms and cannons. Knights were replaced by the foot soldier who carried firearms.

Between 1670 and 1729 William Congreve developed rockets to use during wars.

In the seventeenth century the gun was developed by the English and Dutch armies.

## **Lenses ( Microscope and Telescope)**

The first useful microscope was developed in the Netherlands between 1590 and 1608. Three different eyeglass makers are given credit for this invention. The inventor was probably Hans Lippershey who developed the first real telescope, or Hans Janssen and his son Zacharias.

Galileo helped popularize the microscope in the early 17th century. After Robert Hooke published his book *Micrographia* in 1665 men began to take the microscope seriously.

Many people feared the microscope until the 19th century when improvements made to the lenses created a clear image. At this time many advances in medicine and hygiene could be made with the microscope.

In 1608 a Dutch eyeglass maker named Hans Lippershey made the first telescope. In 1668 Isaac Newton improved the telescope by adding mirrors instead of lenses.

Galileo Galileo was the first person to use the telescope to study the heavens. He made many discoveries including that the moon had huge valleys and craters. He also discovered four moons orbiting Jupiter. Galileo discovered the planets revolve around the sun and not around the earth. His discoveries were printed in a book called *Starry Messenger* in 1610.

## **Printing Press**

The printing press was invented in 1436 by a German named Johannes Gutenberg. Gutenberg was a goldsmith. Before the printing press was invented, monks had to copy everything by hand. Hand written books took months or years to hand print. This made books very expensive.

Ink, movable type, paper, and the press had been invented. Gutenberg creatively combined these inventions to devise the printing press. Gutenberg used the printing press to put ink on hundreds of individual letters. These letters were engraved in slabs of brass. These letters were arranged in words, sentences, then paragraphs. After this stage as many copies as needed could be made quickly. When a different page was needed the individual letters had to be completely rearranged.

The Bible was the first book to be mass produced. The Gutenberg Bible was also known as the 42 line Bible from the number of lines on each page. It was published in 1456 in Mainz, Germany.