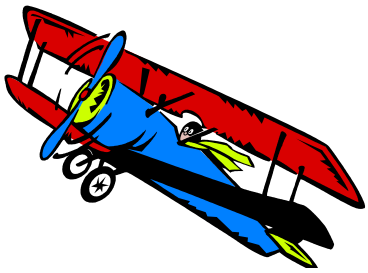

LEST WE FORGET

Entrepreneurs have been breaking new ground for many centuries. Their stories provide ideas about finding opportunities for both students and teachers. Meet some of these "giants" and learn how they conquered some of their challenges.

Walter Hunt: Inventor Of The Safety Pin: The safety pin was the invention of Walter Hunt. The safety pin was invented while Hunt was twisting a piece of wire, trying to think of something that would help him pay off a fifteen-dollar debt. On April 10, 1849 the safety pin was patented. Hunt thought little of his safety pin as an invention and soon sold the patent for four hundred dollars.

Hunt was a mechanic from New York, whose other inventions include a forerunner of the Winchester repeating rifle. In 1834, Hunt built America's first sewing machine. He later lost interest in patenting his sewing machine, because he believed the invention would cause unemployment.

Ball Corporation: www.ball.com The five founding Ball brothers started their company in 1880 in Buffalo, New York. Two of the brothers, Frank and Edmund, borrowed $200 from their Uncle George, a minister, to go into business selling wood-jacketed tin containers to hold paint, varnishes and kerosene. They named their business the Wooden Jacket Can Company.

Their product was so successful they expanded their line. Soon, the brothers had refined their original product to tin-jacketed, glass-lined containers. In 1884, the renamed Ball Brothers Glass Manufacturing Company began manufacturing yet another new product - the home canning jar, which would one day make Ball a household name. Ball has grown to an international manufacturing company in its 100 years of existence. It is best known for its home canning jars that it no longer makes.

International Business Machines - IBM
Herman Hollerith, a German immigrant and Census Bureau statistician, whose Punch Card Tabulating Machine used an electric current to sense holes in punch cards and keep a running total of data formed the Tabulating Machine Co. in 1896. Today operating as IBM it develops, manufactures and sells advanced technology processing products, including computers and microelectronic technology, software, networking systems and information technology-related services on a worldwide scale.

Kodak: When **George Eastman** was 24, he made plans for a vacation to Santo Domingo. To make a record of the trip, Eastman bought a photographic outfit with all the paraphernalia of the wet plate days. The camera was as big as a microwave oven and needed a heavy tripod. There were chemicals, glass tanks, a heavy plate holder, and a jug of water. The complete outfit "was a pack-horse load" as he described it. Learning how to use it to take pictures cost $5.

To find a better way to take pictures Eastman worked at the bank during the day and experimented at home in his mother's kitchen at night. His mother said that some nights Eastman was so tired he couldn't undress, but slept on a blanket on the floor beside the kitchen stove.

By 1880, he had invented and patented not only a dry plate formula, but also a machine for preparing large numbers of the plates. He quickly recognized the possibilities o f making dry plates for sale to other photographers.

"The idea gradually dawned on me," he later said, "that what we were doing was not merely making dry plates, but that we were starting out to make photography an everyday affair." Or as he described it more succinctly "to make the camera as convenient as the pencil."

Microsoft - Microsoft was formed soon after the introduction of a special kit computer--the MITS Altair. Building software as a business was an odd notion in 1975, but two young men, Paul Allen and Bill Gates both saw it as an obvious path and headed down it as fast as they could. From that beginning it has grown to be one of the most successful computer software firms in the world.

Popular Mechanics, forecasting future technological advances in1949 said "Computers in the future may weigh no more that 1.5 tons."

Mattel began in 1945, operating out of a garage workshop. The original founders were Harold Matson and Elliot Handler, who coined "Mattel" by combining letters of their last and first names, respectively. Their first product was picture frames, but Elliot developed a side business in doll house furniture made from picture frame scraps, which led to toys, toys, toys and Barbie.

Abbott Laboratories

Founded by Dr. Wallace C. Abbott in 1888 who used the active part of medicinal plants to form tiny pills, called "dosimetric granules," which provided a precisely measured amount of drug. Abbott Laboratories has evolved into one of the world's leading health care companies.

Arco

Founded as the Atlantic Petroleum Storage Company in Philadelphia in1966, Arco has been owned by John D. Rockefeller's Standard Oil (dissolved in 1911), merged with Richfield Oil and Sinclair Oil and partnered with Exxon. Today it is the seventh largest oil company with worldwide interests.

Chevron

The Standard Oil Company of California (now Chevron) in 1907 was seeking an easier and safer way to refuel automobiles. They built the first U.S. service station near their Seattle kerosene refinery. This has led to a satellite dealer communication network with "convenience" as the operative world, a worldwide shipping operation, and landmark oil discoveries.

Texaco

In 1903, vision, opportunity and a little luck came together for Joe "Buckskin" Cullinan, an oilpatch veteran, and Arnold Schlaet, a New York investor. Their fledgling oil firm, The Texas Company, formed in Beaumont, Texas, just a year earlier, hit "black gold" in the nearby Sour Lake field. What started on a $3 million investment in 1902, grew to become Texaco Inc., a perennial Fortune 50 performer. At year-end 1997, about 29,300 employees operated in some 150 countries, their assets totaled $29.6 billion, and their annual revenues came to nearly $47 billion.

Booz, Allen and Hamilton

Edwin G. Booz graduated from Northwestern in 1914 and started his own business performing studies and statistical analyses for business. In Fiscal Year 1998 , Booz·Allen's sales exceeded $1.4 billion with a staff of more than 8,500 members located in over 90 offices around the world.

Levi Strauss & Co.

In 1853 Levi Strauss set up a small dry goods house in San Francisco. May 1998 marked the 125th anniversary of the day that Levi Strauss and Jacob Davis obtained a U.S. patent on the process of putting rivets in men's work pants for the very first time, i.e., the anniversary of the invention of blue jeans. Today Levi Strauss & Co. (LS&CO.) markets brand-name apparel in more than 60 countries. The company employs a staff of about 1,900 people at its San Francisco headquarters, and

approximately 30,000 people worldwide. It operates 41 production facilities and 27 customer service centers in more than 50 countries.

Matsushita

Founded by Konosuke Matsushita as Matsushita Electric Housewares Manufacturing Works in 1918. The first product was an attachment plug. With sales totaling almost 40 billion dollars in 1998, it is now an industry leader making products in the following areas: AV Hardware, Information and Communications, Systems and Engineering, Home Appliances, Housing Equipment, Air Conditioning Equipment, Health Care, Production and Industrial Equipment, Components, and Networks and Software.

STEPS IN COMPUTER DEVELOPMENT…

1955 A challenge to Remington Rand emerges with the introduction of IBM's 700 line. Thomas Watson, Jr., who recently took over management of the company from his legendary father, leads the product introduction efforts.

1956 John Bachus and his IBM team invent FORTRAN, the first high-level programming language.

1957 Grace Hopper helps develop the Flow-matic programming language in 1957 and COBOL (Common Business-Oriented Language) for the UNIVAC from 1959-1961.

1958 Control Data Corporation introduces the 1604, designed by Seymour Cray -- one of the first fully transistorized computers -- at a bargain price of $1.5 million (half the cost of the competitive IBM machine).

1959 Robert Noyce of Fairchild Semiconductors seeks a patent for a new invention: the integrated circuit.

By 1960, 2,000 computers are in use in the United States.

1960 Digital Equipment Corporation introduces its first minicomputer, the PDP-1, priced at a relatively modest $120,000 (modest, at least, compared to the price of mainframe systems). Intrigued by their newfound power, two hackers from MIT create the first computer video game, Spacewar!

The first integrated circuits reach the market, costing $120. NASA selects Noyce's invention for the on-board computers of the Gemini spacecraft.

1962 Ivan Sutherland demonstrates Sketchpad, a drawing program that is twenty years ahead of its time, on a TX-2 defense computer. Sketchpad is the first program to use windows, icons, and a light pen, allowing easy manipulation of graphics and text on-screen.

1964 IBM announces System 360, a family of computers that can be used for science and business, and share the same software, printers, and tape drives.

The first Local Area Network (LAN) is developed at Lawrence Livermore Labs.

BASIC is developed at Dartmouth College by John Kemeny and Thomas Kurtz.

The first integrated circuit sold commercially is used in a Zenith hearing aid.

1965 Moore's Law predicts that the number of components on an integrated circuit would double every year and the cost of computers would be cut in half.

Computing comes out of the lab with the introduction of the Digital Equipment Corporation PDP-8 minicomputer. Its speed, footprint (about the size of a small refrigerator), and reasonable cost (a mere $18,000) make the DEC PDP-8 the first successful minicomputer. Before long, 50,000 systems are running in business, production, and research, expanding computing to a broader base of users.

1968 Doug Engelbart of the Pentagon's Advanced Research Projects Agency (ARPA) demonstrates a new way of interacting with a computer, using a keyboard and mouse.

Fairchild veterans Robert Noyce and Gordon Moore found Intel Corporation in Santa Clara, California.

1970 Xerox creates the Palo Alto Research Center (PARC) to investigate what they call the "architecture of information" and make computers easy enough for anyone to use. Using the idea that people will respond better to intuitive command structures don't need to understand how the hardware functions to use the technology, PARC comes up with black-on-white screens, a bitmapped display, icons, pointers, laser printers, word processors, and networks (notably Ethernet).

1971 "Announcing a new era of integrated electronics... a microprogrammable computer on a chip". Intel ad introducing the 4004 microprocessor.

1972 Intel Corporation introduces the 8008 microprocessor.

Nolan Bushnell of Atari introduces Pong, the first major coin-operated electronic video game.

1975 Popular Electronics announces the Altair, the first "personal computer".

Ed Roberts. MITS, or Micro Instrumentation and Telemetry Systems had already developed products as diverse as radio transmitters for model rockets and calculators when founder Ed Roberts decided to take a gamble on a digital computer. The Altair 8800 was marketed as a kit based on Intel's new 8080 microprocessor, and it didn't do a whole lot -- there was no keyboard and no monitor. What's more, there were no languages or programs to run on it. Despite the fact that you had to be both a mechanic and a programmer to get the thing to work, this first "personal computer" would spark a revolution.

1968 Bill Gates and Paul Allen use their first computer, an ASR-33 Teletype with access to a GE Mark II, and get their first taste of BASIC, a simple computer language. There is no such thing yet as a "personal computer", of course -- Gates and Allen are working on a timesharing system that splits up time simultaneously among many users. The system has some aspects of personal computing, however, in that it allows immediate interactive access to the machine, rather than the "turn-in-your-punch-cards-and-wait" process that is typical of dedicated mainframe system

Texas Instruments. Born in the wildcat oil days in Texas, the company began with 12 exploration crews living a nomadic life in the oilpatch. In the six decades since then, Texas Instruments has created milestone innovations, including the first commercial silicon transistors, the first integrated circuit, and the first electronic hand-held calculator.

The History of 7 Up

Charles Leiper Grigg was born in 1868 in Price's Branch, Missouri. As an adult, Grigg moved to St. Louis and started working in advertising and sales, where he was introduced to the carbonated beverage business. By 1919, Grigg was working for a manufacturing company owned by Vess Jones. It was there that Grigg invented and marketed his first soft drink called "Whistle".

After a dispute with management, Grigg quit his job (giving away "Whistle") and started working for the Warner Jenkinson Company, developing flavoring agents for soft drinks. Grigg invented then his second soft drink called called "Howdy". When he eventually moved on from Warner Jenkinson Co., he took his soft drink "Howdy" with him.

Together with financier Edmund G. Ridgway, Grigg went on to form the Howdy Company. So far, Grigg had invented two orange-flavored soft drinks. But his soft drinks struggled against the king of all orange pop drinks, "Orange Crush". "Orange Crush" grew to dominate the market for orange sodas.

Grigg decided to focus on lemon-lime flavors and by October of 1929 he had invented a new drink called, "Bib-Label Lithiated Lemon-Lime Sodas". The name was quickly changed to " 7 Up Lithiated Lemon-Lime" and then again quickly changed to just plain "7 Up".

"7 Up" merged with "Dr Pepper" in 1986