

**State Council of Educational Research and Training, Chennai -6.****Diploma in Elementary Education****Academic Year 2014 – 2015*****A literary genius, it is said, resembles all, though no one resembles him - Dr. Sarvepalli Radhakrishnan***

**Learning** is acquiring new, or modifying and reinforcing, existing knowledge, behaviors, skills, values, or preferences and may involve synthesizing different types of information. The ability to learn is possessed by humans, animals and some machines. Progress over time tends to follow learning curves. Learning is not compulsory; it is contextual. It does not happen all at once, but builds upon and is shaped by what we already know. To that end, learning may be viewed as a process, rather than a collection of factual and procedural knowledge. Learning produces changes in the organism and the changes produced are relatively permanent.

**Wisdom** is

the ability or result of an ability to think and act utilizing knowledge, experience, understanding, commonsense, and insight,

accumulated knowledge, erudition, or enlightenment,

*archaic* a wise saying or wise sayings or teachings and

*obsolete* soundness of mind

**Practicum** is defined as a course or study wherein the student is able to apply the theories and lessons learned, as well as gain practical, on-the-job training in a particular field of study.

**Students:** a person formally engaged in learning, esp. one enrolled in an institution of secondary or higher education.



## மாதிரி கால அட்டவணை

கால அளவு	நிகழ்வுகள்
25 நிமிடம்	இறை வணக்கம் (தமிழ்த் தாய் வாழ்த்து, கொடி ஏற்றுதல், கொடி வணக்கம், கொடிப் பாடல், உறுதி மொழி, சர்வ சமய வழிபாடு, திருக்குறள் விளக்கத்துடன், செய்தி, இன்றைய சிந்தனை, முதல்வர் உரை, நாட்டுப் பண்)
60 நிமிடம்	முதல் பாட வேளை
60 நிமிடம்	இரண்டாம் பாட வேளை
10 நிமிடம்	இடை வேளை
60 நிமிடம்	மூன்றாம் பாட வேளை
30 நிமிடம்	மதிய உணவு இடை வேளை
60 நிமிடம்	நான்காம் பாட வேளை
60 நிமிடம்	ஐந்தாம் பாட வேளை
10 நிமிடம்	இடை வேளை
60 நிமிடம்	ஆறாம் பாட வேளை
60 நிமிடம்	நூலகம், ஆங்கில மொழித்திறன் பயிற்சி, கணினிப் பயிற்சி, பாட இணைச் செயல்கள்

**July 2014**

<b>Date</b>	<b>Day</b>	<b>Event</b>	<b>Remarks</b>
01/07/2014	Tuesday		
02/07/2014	Wednesday	II Year Classes reopen	
03/07/2014	Thursday		
04/07/2014	Friday		
05/07/2014	Saturday		
06/07/2014	Sunday	Holiday	
07/07/2014	Monday		
08/07/2014	Tuesday		
09/07/2014	Wednesday		
10/07/2014	Thursday		
11/07/2014	Friday		
12/07/2014	Saturday	Holiday	
13/07/2014	Sunday	Holiday	
14/07/2014	Monday		
15/07/2014	Tuesday		
16/07/2014	Wednesday	I Year Classes open	
17/07/2014	Thursday		
18/07/2014	Friday		
19/07/2014	Saturday	Holiday	
20/07/2014	Sunday	Holiday	
21/07/2014	Monday		
22/07/2014	Tuesday		
23/07/2014	Wednesday		
24/07/2014	Thursday		
25/07/2014	Friday		
26/07/2014	Saturday	Holiday	
27/07/2014	Sunday	Holiday	
28/07/2014	Monday		
29/07/2014	Tuesday		
30/07/2014	Wednesday		
31/07/2014	Thursday	Last Date for I Year Admission	

**August 2014**

<b>Date</b>	<b>Day</b>	<b>Event</b>	<b>Remarks</b>
01/08/2014	Friday		
02/08/2014	Saturday	Holiday	
03/08/2014	Sunday	Holiday	
04/08/2014	Monday	<b>II Year Observation (10 days)</b>	
05/08/2014	Tuesday		
06/08/2014	Wednesday		
07/08/2014	Thursday		
08/08/2014	Friday		
09/08/2014	Saturday	Holiday	
10/08/2014	Sunday	Holiday	
11/08/2014	Monday		
12/08/2014	Tuesday		
13/08/2014	Wednesday		
14/08/2014	Thursday		
15/08/2014	Friday	<b>Independence Day</b>	
16/08/2014	Saturday	Holiday	
17/08/2014	Sunday	Holiday	
18/08/2014	Monday		
19/08/2014	Tuesday		
20/08/2014	Wednesday	<b>Communal Harmony Day</b>	
21/08/2014	Thursday	Student Approval	
22/08/2014	Friday	Student Approval	
23/08/2014	Saturday	Holiday	
24/08/2014	Sunday	Holiday	
25/08/2014	Monday		
26/08/2014	Tuesday		
27/08/2014	Wednesday		
28/08/2014	Thursday		
29/08/2014	Friday	<b>Vinayagar Chaturthi -Holiday</b>	
30/08/2014	Saturday	Holiday	
31/08/2014	Sunday	Holiday	

**September 2014**

<b>Date</b>	<b>Day</b>	<b>Event</b>	<b>Remarks</b>
01/09/2014	Monday		
02/09/2014	Tuesday		
03/09/2014	Wednesday		
04/09/2014	Thursday		
05/09/2014	Friday	Teacher's Day	
06/09/2014	Saturday	Yoga for II Year	
07/09/2014	Sunday	Holiday	
08/09/2014	Monday		
09/09/2014	Tuesday		
10/09/2014	Wednesday	I Year Observation (10 days)	
11/09/2014	Thursday		
12/09/2014	Friday		
13/09/2014	Saturday	Yoga for II Year	
14/09/2014	Sunday	Holiday	
15/09/2014	Monday		
16/09/2014	Tuesday		
17/09/2014	Wednesday		
18/09/2014	Thursday		
19/09/2014	Friday		
20/09/2014	Saturday	Yoga for II Year	
21/09/2014	Sunday	Holiday	
22/09/2014	Monday		
23/09/2014	Tuesday	I Year Observation ends	
24/09/2014	Wednesday		
25/09/2014	Thursday		
26/09/2014	Friday		
27/09/2014	Saturday	Yoga for II Year	
28/09/2014	Sunday	Holiday	
29/09/2014	Monday		
30/09/2014	Tuesday		

## October 2014

Date	Day	Event	Remarks
01/10/2014	Wednesday		
02/10/2014	Thursday	<b>Autha Pooja &amp; Gandhi Jayanthi - Holiday</b>	
03/10/2014	Friday	<b>Vijaya dasami - Holiday</b>	
04/10/2014	Saturday		
05/10/2014	Sunday	<b>Bakrith - Holiday</b>	
06/10/2014	Monday	<b>II Year Teaching Practice (15 Days)</b>	
07/10/2014	Tuesday		
08/10/2014	Wednesday		
09/10/2014	Thursday	<b>Field Trip</b>	
10/10/2014	Friday	<b>Field Trip</b>	
11/10/2014	Saturday	Yoga for II Year	
12/10/2014	Sunday	Holiday	
13/10/2014	Monday	Art and Craft Work I Year	
14/10/2014	Tuesday	Art and Craft Work I Year	
15/10/2014	Wednesday		
16/10/2014	Thursday	Scouts & Guides Introduction I Year	
17/10/2014	Friday	Scouts & Guides Introduction I Year	
18/10/2014	Saturday	Scouts & Guides Introduction I Year	
19/10/2014	Sunday	Holiday	
20/10/2014	Monday		
21/10/2014	Tuesday		
22/10/2014	Wednesday	<b>Deepavali - Holiday</b>	
23/10/2014	Thursday		
24/10/2014	Friday		
25/10/2014	Saturday	Yoga for II Year	
26/10/2014	Sunday	Holiday	
27/10/2014	Monday		
28/10/2014	Tuesday		
29/10/2014	Wednesday	<b>II Year Teaching Practice ends</b>	
30/10/2014	Thursday	Tree Plantation I Year	
31/10/2014	Friday	Tree Plantation I Year	

**November 2014**

<b>Date</b>	<b>Day</b>	<b>Event</b>	<b>Remarks</b>
01/11/2014	Saturday	Yoga for II Year	
02/11/2014	Sunday		
03/11/2014	Monday		
04/11/2014	Tuesday	<b>Moharam - Holiday</b>	
05/11/2014	Wednesday	<b>I Year Teaching Practice (15 Days)</b>	
06/11/2014	Thursday		
07/11/2014	Friday		
08/11/2014	Saturday	Yoga for II Year	
09/11/2014	Sunday	Holiday	
10/11/2014	Monday		
11/11/2014	Tuesday		
12/11/2014	Wednesday		
13/11/2014	Thursday		
14/11/2014	Friday	<b>Children's day</b>	
15/11/2014	Saturday	Yoga for II Year	
16/11/2014	Sunday	Holiday	
17/11/2014	Monday		
18/11/2014	Tuesday		
19/11/2014	Wednesday		
20/11/2014	Thursday	Art and Craft Work II Year	
21/11/2014	Friday	Art and Craft Work II Year	
22/11/2014	Saturday	Yoga for II Year	
23/11/2014	Sunday	Holiday	
24/11/2014	Monday		
25/11/2014	Tuesday		
26/11/2014	Wednesday	<b>I Year Teaching Practice ends</b>	
27/11/2014	Thursday	Medical Camp I & II Year	
28/11/2014	Friday	Medical Camp I & II Year	
29/11/2014	Saturday	Yoga for II Year	
30/11/2014	Sunday	Holiday	

**December 2014**

<b>Date</b>	<b>Day</b>	<b>Event</b>	<b>Remarks</b>
01/12/2014	Monday		
02/12/2014	Tuesday		
03/12/2014	Wednesday		
04/12/2014	Thursday		
05/12/2014	Friday		
06/12/2014	Saturday	Yoga for II Year	
07/12/2014	Sunday	Holiday	
08/12/2014	Monday		
09/12/2014	Tuesday		
10/12/2014	Wednesday		
11/12/2014	Thursday		
12/12/2014	Friday	<b>RRC Activities</b>	
13/12/2014	Saturday	Yoga for II Year	
14/12/2014	Sunday	Holiday	
15/12/2014	Monday		
16/12/2014	Tuesday		
17/12/2014	Wednesday	<b>I Term Exam I &amp; II Year</b>	
18/12/2014	Thursday		
19/12/2014	Friday		
20/12/2014	Saturday	Yoga for II Year	
21/12/2014	Sunday	Holiday	
22/12/2014	Monday		
23/12/2014	Tuesday		
24/12/2014	Wednesday		
25/12/2014	Thursday	<b>Christmas - Holiday</b>	
26/12/2014	Friday		
27/12/2014	Saturday	Yoga for II Year	
28/12/2014	Sunday	Holiday	
29/12/2014	Monday		
30/12/2014	Tuesday		
31/12/2014	Wednesday		



## January 2015

Date	Day	Event	Remarks
01/01/2015	Thursday	<b>New Year - Holiday</b>	
02/01/2015	Friday		
03/01/2015	Saturday	Yoga for II Year	
04/01/2015	Sunday	Holiday	
05/01/2015	Monday	<b>II Year Teaching Practice (15)</b>	
06/01/2015	Tuesday		
07/01/2015	Wednesday		
08/01/2015	Thursday		
09/01/2015	Friday		
10/01/2015	Saturday	Yoga for II Year	
11/01/2015	Sunday	Holiday	
12/01/2015	Monday		
13/01/2015	Tuesday		
14/01/2015	Wednesday	<b>Pongal - Holiday</b>	
15/01/2015	Thursday	<b>Thiruvalluvar Day - Holiday</b>	
16/01/2015	Friday	<b>Ulavar Day - Holiday</b>	
17/01/2015	Saturday	Holiday	
18/01/2015	Sunday	Holiday	
19/01/2015	Monday		
20/01/2015	Tuesday		
21/01/2015	Wednesday		
22/01/2015	Thursday		
23/01/2015	Friday		
24/01/2015	Saturday	Yoga for II Year	
25/01/2015	Sunday	Holiday	
26/01/2015	Monday	<b>Republic Day - Holiday</b>	
27/01/2015	Tuesday		
28/01/2015	Wednesday		
29/01/2015	Thursday		
30/01/2015	Friday	<b>II Year Teaching Practice ends</b>	
31/01/2015	Saturday		

## February 2015

Date	Day	Event	Remarks
01/02/2015	Sunday	Holiday	
02/02/2015	Monday	I Year Teaching Practice (15 Days)	
03/02/2015	Tuesday		
04/02/2015	Wednesday	NSS Camp 7 Days II Year	
05/02/2015	Thursday		
06/02/2015	Friday		
07/02/2015	Saturday	Yoga for II Year	
08/02/2015	Sunday	Holiday	
09/02/2015	Monday		
10/02/2015	Tuesday		
11/02/2015	Wednesday		
12/02/2015	Thursday		
13/02/2015	Friday		
14/02/2015	Saturday	Yoga for II Year	
15/02/2015	Sunday	Holiday	
16/02/2015	Monday		
17/02/2015	Tuesday		
18/02/2015	Wednesday		
19/02/2015	Thursday		
20/02/2015	Friday	I Year Teaching Practice ends	
21/02/2015	Saturday	Yoga for II Year	
22/02/2015	Sunday	Holiday	
23/02/2015	Monday	Science Week	
24/02/2015	Tuesday	Science Week	
25/02/2015	Wednesday	Science Week	
26/02/2015	Thursday	Science Week	
27/02/2015	Friday	Science Week	
28/02/2015	Saturday	Holiday	

## March 2015

Date	Day	Event	Remarks
01/03/2015	Sunday	Holiday	
02/03/2015	Monday	<b>Project Work I II Year</b>	
03/03/2015	Tuesday	<b>Project Work I II Year</b>	
04/03/2015	Wednesday	<b>Project Work I II Year</b>	
05/03/2015	Thursday	<b>Project Work I II Year</b>	
06/03/2015	Friday	<b>Project Work I II Year</b>	
07/03/2015	Saturday	Holiday	
08/03/2015	Sunday	Holiday	
09/03/2015	Monday	<b>Project Work I II Year</b>	
10/03/2015	Tuesday	<b>Project Work I II Year</b>	
11/03/2015	Wednesday	<b>Project Work I II Year</b>	
12/03/2015	Thursday		
13/03/2015	Friday		
14/03/2015	Saturday	Holiday	
15/03/2015	Sunday	Holiday	
16/03/2015	Monday		
17/03/2015	Tuesday		
18/03/2015	Wednesday		
19/03/2015	Thursday	<b>TLM Preparation Workshop</b>	
20/03/2015	Friday	<b>TLM Preparation Workshop</b>	
21/03/2015	Saturday	Holiday	
22/03/2015	Sunday	Holiday	
23/03/2015	Monday		
24/03/2015	Tuesday		
25/03/2015	Wednesday		
26/03/2015	Thursday	<b>Annual and Sports Day</b>	
27/03/2015	Friday	<b>Annual and Sports Day</b>	
28/03/2015	Saturday	Holiday	
29/03/2015	Sunday	Holiday	
30/03/2015	Monday		
31/03/2015	Tuesday	<b>Telugu New Year - Holiday</b>	

## April 2015

Date	Day	Event	Remarks
01/04/2015	Wednesday	Internal Examination II & I Year	
02/04/2015	Thursday		
03/04/2015	Friday		
04/04/2015	Saturday	Holiday	
05/04/2015	Sunday	Holiday	
06/04/2015	Monday		
07/04/2015	Tuesday		
08/04/2015	Wednesday		
09/04/2015	Thursday		
10/04/2015	Friday		
11/04/2015	Saturday	Holiday	
12/04/2015	Sunday	Holiday	
13/04/2015	Monday	<b>Mahavir Jayanthi - Holiday</b>	
14/04/2015	Tuesday	<b>Tamil New Year / Dr. Ambedkar Birth Day - Holiday</b>	
15/04/2015	Wednesday		
16/04/2015	Thursday		
17/04/2015	Friday	<b>Good Friday - Holiday</b>	
18/04/2015	Saturday	Holiday	
19/04/2015	Sunday	<b>Easter - Holiday</b>	
20/04/2015	Monday		
21/04/2015	Tuesday		
22/04/2015	Wednesday		
23/04/2015	Thursday		
24/04/2015	Friday		
25/04/2015	Saturday	Holiday	
26/04/2015	Sunday	Holiday	
27/04/2015	Monday		
28/04/2015	Tuesday		
29/04/2015	Wednesday		
30/04/2015	Thursday		

**May 2015**

<b>Date</b>	<b>Day</b>	<b>Event</b>	<b>Remarks</b>
01/05/2015	Friday	<b>May Day - Holiday</b>	
02/05/2015	Saturday	Holiday	
03/05/2015	Sunday	Holiday	
04/05/2015	Monday	II Term Exam I & II Year	
05/05/2015	Tuesday		
06/05/2015	Wednesday		
07/05/2015	Thursday		
08/05/2015	Friday		
09/05/2015	Saturday	Holiday	
10/05/2015	Sunday	Holiday	
11/05/2015	Monday		
12/05/2015	Tuesday		
13/05/2015	Wednesday		
14/05/2015	Thursday		
15/05/2015	Friday		
16/05/2015	Saturday	Holiday	
17/05/2015	Sunday	Holiday	
18/05/2015	Monday		
19/05/2015	Tuesday		
20/05/2015	Wednesday		
21/05/2015	Thursday		
22/05/2015	Friday		
23/05/2015	Saturday	Holiday	
24/05/2015	Sunday	Holiday	
25/05/2015	Monday		
26/05/2015	Tuesday		
27/05/2015	Wednesday		
28/05/2015	Thursday		
29/05/2015	Friday		
30/05/2015	Saturday	Holiday	
31/05/2015	Sunday	Holiday	

## June 2015

<b>Date</b>	<b>Day</b>	<b>Event</b>	<b>Remarks</b>
01/06/2015	Monday		
02/06/2015	Tuesday		
03/06/2015	Wednesday		
04/06/2015	Thursday		
05/06/2015	Friday		
06/06/2015	Saturday	Holiday	
07/06/2015	Sunday	Holiday	
08/06/2015	Monday		
09/06/2015	Tuesday		
10/06/2015	Wednesday	<b>II Year Exam</b>	
11/06/2015	Thursday	<b>II Year Exam</b>	
12/06/2015	Friday	<b>II Year Exam</b>	
13/06/2015	Saturday	<b>II Year Exam</b>	
14/06/2015	Sunday	Holiday	
15/06/2015	Monday	<b>II Year Exam</b>	
16/06/2015	Tuesday	<b>II Year Exam</b>	
17/06/2015	Wednesday	<b>II Year Exam</b>	
18/06/2015	Thursday		
19/06/2015	Friday		
20/06/2015	Saturday	Holiday	
21/06/2015	Sunday	Holiday	
22/06/2015	Monday	<b>I Year Exam</b>	
23/06/2015	Tuesday	<b>I Year Exam</b>	
24/06/2015	Wednesday	<b>I Year Exam</b>	
25/06/2015	Thursday	<b>I Year Exam</b>	
26/06/2015	Friday	<b>I Year Exam</b>	
27/06/2015	Saturday	<b>I Year Exam</b>	
28/06/2015	Sunday	Holiday	
29/06/2015	Monday	<b>I Year Exam</b>	
30/06/2015	Tuesday		

## Inventions and Discoveries by Scientist - A to Z List

**Adding Machine**, 1642. Inventor : Blaise Pascal (France) (1623-62).  
Earliest commercial machine invented by William Burroughs (U.S.) in St. Louis, Missouri in 1885.

**Addressograph**, 1893. Inventor : J.S. Duncan (U.S.). Manufactured in Chicago, Illinois.

**Airplane**, 1903. Inventors: Orville Wright (1871-1948) and Wilbur Wright (1867-1912), (U.S.) Kitty Hawk, North Carolina.

**Airship (non-rigid)**, 1852. Inventor : Henri Giffard (France) (1825-82).  
Steam-powered propeller flew over Paris (1852).

**Airship (rigid)**, 1900. Inventor : Graf Ferdinand von Zeppelin (Germany) (1838- 1917). Bodensee.

**Antiseptic**, 1867. Inventor : Dr. Joseph Lister (England).

**Arc Lamp**, 1879. Inventor : C.F. Brush (U.S.) (1849-1929). Cleveland, Ohio.

**Argon**, 1894. Discoverers : Sir William Ramsay and Baron Ray Leigh (Great Britain).

**Aspirin**, 1899. Inventor : Dr. Felix Hoffman, Germany.

**Atom Bomb**, 1945. Inventor : Julius Robert Oppenheimer (U.S) (1904-1967).

**Autogiro**, 1923. Inventor : Juan de la Cierva (Spain) (1896-1963).  
Horizontal unpowered rotor.

**Automobile (steam)**, c. 1769. Inventor : Nicolas Cugnot (France) (1725-1804). Three-wheeled military tractor. Oldest surviving is Italian Bordino (1854) in Turin.

**Automobile (gasoline)**, 1855. Inventor : Karl Benz (Germany) (1844-1929).  
Earliest model by Father Ferdinand Verbiest (d. 1687) c. 1665 in China.  
Earliest internal combustion automobile built (1862-63) by Jean Joseph Etienne Lenior (1822-1900) (France). First run by Benz Motorwagon, Manneheim in November or December 1885. Patented in January 29, 1886. First powered handcart with internal combustion engine was by Siegfried Marcus (Austria) (c. 1864).

**Bakelite**, 1907. Inventor : Lwo H. Backland (Belgium/U.S.) (1863-1944).

**Balloon**, 1783. Inventor : Jacques Montgolfier (1755-99) and Joseph Montgolfier (France) (1740-1810). Tethered flight, Paris (October 15); manned free flight, Paris.

**Ballpoint Pen**, 1888. Inventor : John J. Loud (U.S.). First practical models by Ladisloa and George Biro (Hungary) in 1938.

**Barbed Wire**, 1873. Inventor : Joseph F. Glidden (U.S.); manufactured at De Kalb, Illinois.

**Bicycle Tyres (pneumatic)**, 1888. Inventor : John Boyd Dunlop (Scotland) (1840-1921). Principle patented but undeveloped by Orbert William Thomson(Scotland), June 10 1885. First motor car pneumatic tyres adapted by Andre and Edouard Michelin (France), 1885

**Bifocal Lens**, 1780. Inventor : Benjamin Franklin (1706-90) (U.S.). His earliest experiments began c. 1760.

**Bullet**, 1849. Inventor : Claude Minie (France).

**Bunsen Burner**, 1858. Inventor : Robert Wilhelm von Bunsen (Germany) (1811-99). Michael Faraday (1791-1867) (England) had previously designed an adjustable burner.

**Burglar Alarm**, 1851. Inventor : Edwin T. Holmes (U.S.). Electric installed, Boston Massachusetts (February 21).

**Cadmium**, 1817. Discovered : Friedrich Stromeyer (Germany).

**Cannon (iron)**, c. 1320. Inventor : Germany. Earliest English illustration dated 1326.

Carburettor, 1876. Inventor : Gottlieb Daimler (Germany) (1834-1900). Carburettor spray; Charles E. Duryea (U.S.) 1892.

**Carpet Sweeper**, 1876. Inventor : Melville R. Bissell (U.S.). Grand Rapids, March. (Patent, September 19).

**Car Radio**, 1929. Inventors : William Lear and Elmer Wavering (USA).

**Cash Register**, 1879. Inventor : James Ritty (U.S.). Built in Dayton, Ohio. Taken over by National Cash Register Co. in 1884.

**Cellophane**, 1900. Inventor : I.E. Brandenberger (Switzerland). Machine production not before 1911.



**Celluloid**, 1861. Inventor : Alexander Parkes (England) (1813-90). Invented in Birmingham, England; developed and trade marked by I.W. Hyatt (U.S.) in 1873.

**Cement**, 1824. Inventor : Joseph Aspdin (England).

**Chain Drive**, 1491-93. Inventor : Leonardo da Vinci (1452-1519). Drawings made in Milan (Italy) were discovered in Spain in 1967.

**Chlorine**, 1774. Discoverer : Karl Wilhelm Scheele (Sweden).

**Chronometer**, 1735. Inventor : John Harrison (England) (1693-1776). Received in 1772 Government £ 20,000 prize.

**Cinema**, 1895. Inventors: Auguste Marie Louis Nocolas Lumicre (1862-1954) and Louis Jean Lumiere (France) (1864-1948). Development pioneers were Etienne Jules Marcy (France) (1830-1903) and Thomas A. Edison (U.S.) (1847-1931). First public showing, Paris (December 28, 1895)

**Classification of Data for Libraries**. Inventor : Melvil Dewey (U.S.) (1851-1913). Introduced his decimal classification in 1876.

**Clock (mechanical)**, 725. Inventors: I-Hsing and Liang Ling-Tsan (China). Earliest escapement 600 years before Europe.

**Clock (pendulum)**, 1657. Inventor : Christian Huygens (Netherlands) (1629-92).

**Dacron**, 1941. Inventors: J.R. Whinfield (1901-66), J.T. Dickson (England). First available 1950, marketed in U.S.

**Dental Plate**, 1817. Inventor : Anthony A. Plantson (U.S.) (1774-1837).

**Dental Plate (rubber)**, 1855. Inventor : Charles Goodyear (U.S) (1845-1921).

**Diesel Engine**, 1895. Inventor : Rudolf Diesel (Germany) (1858-1913). Lower pressure oil engine patent by Stuart Akroyd, 1890. Diesel's first commercial success, Augsburg, 1897.

**Disc Brake**, 1902. Inventor : Dr. F. Lanchester (England). First used on aircraft 1953 (Dunlop Rubber Co.).

**Electric Battery**, 1800. Inventor : Volta (Italian)

**Electric Blanket**; 1946. Inventor : Simmons Co., Petersburg, Virginia, U.S. Thermostatic control.

- Electric Cooking Utensil**, 1874. Inventor : St. George Lane-Fox (England).
- Electric Fan**, 1882. Inventor : Wheeler (USA). Electric Flat Iron, 1882. Inventor : H.W. Seeley (U.S.), New York City.
- Electric Generation (Static)**, 1660. Inventor : Otto von Guericke (Germany).
- Electric Lamp**, 1879. Inventor : Thomas Alva Edison (U.S.) (1847-1931). First practical demonstration at Menlo Park, New Jersey.
- Electric Motor (DC)**, 1873. Inventor : Zenobe Gramme (Belgium) (1826-1901). Exhibited in Vienna.
- Electric Motor (AC)**, 1888. Inventor : Nikola Tesla (U.S.) (1856-1943).
- Electromagnet**, 1824. Inventor : William Sturgeon (England) (b. 1783); improved by Joseph Henry (U.S.) 1831.
- Electromagnetic Induction**, 1831. Inventor : Michael Faraday (Great Britain); discovered previously, but not published, by Joseph Henry (United States).
- Electronic Computer**, 1942. Inventor : J.G. Brainerd, J.P. Eckert, J.W. Mauchly (U.S.). ENIAC (Electronic Numerical Integrator and Circulator), University of Pennsylvania, Philadelphia.
- Elevator**, 1852. Inventor : Elisha G. Otis (U.S.) (1811-61). Earliest elevator at Yonkers, N.Y.
- Film (musical)**, 1923. Inventor : Dr. Lee de Forest (U.S.) New York demonstration (March 13).
- Film (talking)**, 1926. Inventor : Warner Bros. (U.S.). First release Don Juan, Warner Theatre, New York (August 5).
- Fluorine**, 1886. Discoverer : Ferdinand Frederick Henri Moissan (France).
- Food Frozen**, 1923. Inventor : Birdseyes (USA).
- Fountain Pen**, 1884. Inventor : Lewis E. Waterman (U.S.) (1837-1901). Patented by D. Hyde (U.S.), 1830, undeveloped.
- Gas Lighting**, 1792. Inventor : William Murdock (Scotland), (1754-1839). Private house in Cornwall, 1792; Factory, Birmingham, 1798; London Street, 1807.

**Generator**, 1860. Inventor : Piciontti (Italian). Continuous current: improved by Gramme (Belgium). 1870.

**Glass (stained)**, c. 1080. Inventor : Augsburg (Germany). Earliest English, c. 1170, York Minister.

**Glassware**, c. 1500 BC. Inventor : Egypt and Mesopotamia (Today's Iraq). Glass blowing, Syria, c. 50 BC.

**Glider**, 1853. Inventor : Sir George Cayley (England) (1773-1857). Near Brompton Hall, Yorkshire, England. Passenger possibly John Appleby.

**Gramophone**, 1878. Inventor : Thomas Edison (USA).

**Gyro-Compass**, 1911. Inventor : Elmer A. Sperry (U.S.) (1860-1930). Tested on USS Delaware (August 28). Gyroscope devised 1882 by Foucault (France).

**Helicopter**, 1930. Inventor : d' Ascanio (Italy). Co-axial machine. Earliest drawing of principle, Le Mans Museum, France, c. 1460. First serviceable machine by Igor Sikorsky (U.S.). 1939.

**Helium**, 1868. Discoverer : Sir William Ramsay (Great Britain).

**Hovercraft**, 1955. Inventor : C.S. Cockerell (England). Patented December 12. Earliest air-cushion vehicle patent was in 1877 by J.I. Thornycroft (1843-1921) (England). First 'light' Saunders Roe SRNI at. Cowes, England, (May 30, 1959).

**Iron Working**, c. 1000 BC. Inventor : Hallstatt, Austria. Introduced into Britain c. 550 BC.

**Jet Engine**, 1937. Inventor : Sir Frank Whittle (England) (b. 1906). First tested run in 1937. Principles announced by Merconnet (France) 1909 and Maxime Guillaume (France) 1921. First flight August 27, 1939 by Heinkel He.

**Laser**, 1960. Inventor : Dr. Charles H. Townes (U.S.). First demonstration by Theodore Maiman (U.S.). (Abbreviation for Light Amplification by Stimulated Emission of Radiation).

**Lathe**, c. 1500 BC. Inventor : Greeks for wood-working. Possibly developed from potter's wheel. Earliest screw cutting lathe by Henry Maudsly (England) (1771-1831).

**Launderette**, 1934. Inventor : J.F. Cantrell (U.S.), Fort Worth, Texas, April 18.

**Laws of Gravitation and Motion**, 1687. Discovered : Isaac Newton (England).

**Lightning Conductor**, 1752. Inventor : Benjamin Franklin (U.S.) (1706-90), Philadelphia.

**Linoleum**, 1860. Inventor : Frederick Walton (England).

**Locomotive**, 1804. Inventor : Richard Trevithick (England) (1771-1833). Penydarren, Wales, 9 Miles (February 21).

**Loom (power)**, 1785. Inventor : Edmund Cartwright (England) (1743-1823).

**Loudspeaker**, 1924. Inventor : Chester W. Rice and Edward W. Kellogg (U.S.).

**Machine Gun**, 1861. Inventor : Richard Gaffing (U.S.) (1818-1903).

**Maps**, c. 2500 BC. Inventor : Sumerians (clay tablets). Earliest world map by Eratosthenes c. 220 BC.

**Margarine**, 1863. Inventor : Hippolyte Mege-Mouries (France). Initially, made of beef suet, warm milk and sheep stomach lining.

**Match (Safety)**, 1855. Inventor : J.E. Lundstrom (Sweden). Amorphous phosphorus disc, 1845, Anton von Schrotter.

**Microphone**, 1876. Inventor : Alexander Graham Bell (U.S.) (1847-1922). Name coined 1878 by David Hughes.

**Microscope**, 1590. Inventor : Zacharis Janssen (Netherlands). Compound convex-concave lens.

**Microscope (Electron)**, 1939. Inventor : Vladimir Kosme Sworykin (Russia, later U.S) (b. 1889), et al. Demonstrated Camden, New Jersey, 1940.

**Molecular Hypothesis**, 1811. Inventor : Amadeo Avogadro (Italy).

**Motorcycle**, 1848. Inventor : Edward Butler (England). First exhibited 1885 by Daimler, earliest factory in Munich 1893.

**Motor Scooter**, 1919. Inventor : Greville Bradshaw (England).

**Neon Lamp**, 1915. Inventor : Georges Claude (France) (1871-1960). First installation in U.S. Cosmopolitan Theatre, July 1923.

**Night Club**, 1843. Inventor : Paris, France. First was *Le Bai des Anglais*, Paris.

**Nineteenth Laws of Planetary Motion**, 1609. Inventor : Johannes Kepler (Germany).

**Nylon**, 1937. Inventor : Dr. Wallace H. Carothers (U.S.) (1896-1937) at Du Pont Labs, Seaford Delaware, U.S. First stockings made about 1937. Bristle production, February 25, 1938. Yarn production, December 1939.

**Oxygen**, 1775. Discoverer : Antoine Laurent Lavoisier (France).

**Ozone**, 1839. Discoverer : Christian Schonbein (Germany).

**Paper**, c. 150. Invented in China. Introduced to West via Yarkand, c. 750.

Parachute, 1797. Inventor : Andre Jacques Garnerin (France) (1769-1823). First descent from 2,230 ft over Paris. Earliest jump from aircraft March 1, 1912 by Capt A. Berry (U.S.) over St. Louis, Missouri.

**Parchment**, c. 1300 BC. Inventor : Egypt. Modern name from Pergamam, Asia Minor, c. 250 BC.

**Parking Meter**, 1935. Inventor : Corlton C. Magee (U.S.). Oklahoma City (July 16).

**Phonograph**, 1878. Inventor : Thomas Alva Edison (U.S.) (1847-1931). Head cranked cylinder at Menlo Park. J. J. Patent, February 19. First described on April 30, 1877, by Charles Cross (France) (1842-88).

**Phosphorus**, 1669. Discoverer : Hennig Brand (Germany).

**Photography (on metal)**, 1826. Inventor : Joseph Nicéphore Niepce (France) (1765-1833). Sensitised pewter plate, 8 hrs exposure at Chalon-sur-Saone, France.

**Photography (on paper)**, 1835. Inventor : W. H. Fox Talbot (England) (1807-77). Lacock Abbey, Wiltshire, England.

**Photography (on film)**, 1888. Inventor : John Carbutt (U.S.). Kodak by George Eastman (U.S.) (1854-1932), August 1888.

**Piano**, 1709. Inventor : Cristofori (Italy).

**Porcelain**, c. 700. Inventor : China. Reached Baghdad, c. 800.

**Potter's Wheel**, c. 6500 BC. Inventor : Asia Minor. Used in Mesopotamia (Iraq), c. 3000 BC.

**Pneumatic Tyre**. See bicycle tyres (look alphabetically above).

**Printing Press**, c. 1455. Inventor : Johannes Gutenberg (Germany) (c. 1400-68). Hand printing known in India in 868.

**Printing (Rotary)**, 1846. Inventor : Richard Hoe (U.S.) (1812-86). Philadelphia public ledger rotary printed, 1847.

**Propeller (ship)**, 1827. Inventor : Francis Smith (England) (1808-74).

**Proton**, 1919. Discoverer : Ernest Rutherford (British-New Zealand).

**Pyramid**, c. 2685 BC. Inventor : Egyptians . Earliest was Zoser step pyramid, Saqqara.

**Radar**, 1922. Inventors : Dr. Allbert H. Taylor and Leo C. Young (U.S.). Radio reflection effect noted. First harnessed in 1935 by Sir Robert Watson-Watt (England) (b. 1892).

**Radioactivity**, 1896. Inventor : Antoine Bacqurel (France).

**Radio Telegraphy** (over 1 km), 1895. Inventor : Lord Ernest Rutherford (British-New Zealand) (1871-1937). At Cambridge, England.

**Radio Telegraphy (Trans-Atlantic)**, 1901. Inventor : Guglielmo Marconi (Italy) (1874-1937). From Poldhu, Cornwall to St. Holn's, New Zealand (December 12). Earliest broadcast of speech by Prof. Reginald Fessenden (U.S.) (1868-1932) in Brant Rock, Massachusetts, December 24, 1906.

**Rayon**, 1883. Inventor : Sir Joseph Swann (England) (1828-1917). Production at Courtauld's Ltd., Coventry, England, November 1905. Name "Rayon" adopted in 1924.

**Razor (Safety)**, 1895. Inventor : King C. Gillette (U.S.). First throw-away blades. Earliest fixed safety razor by Kampfe.

**Razor (Electric)**, 1931. Inventor : Col. Jacob Schick (U.S.). First manufactured Stanford, Connecticut; March 18.

**Reaper**, 1826. Inventor : Henry Ogle (U.S.). First practical machine invented by Robert McCormick in Walnutt Grove, Virginia, in 1831.

**Record (long-playing)**, 1948. Inventor : Dr. Petter Goldmark (U.S.). Developed in the CBS Research Labs.

**Refrigerator**, 1851. Inventor : James Harrison [Australian (1816-1893)] Bendigo. Australia, Brewery.

**Revolver**, 1835. Inventor : Samuel Colt (U.S.) (1814-62).

**Rocket Engine**, 1926. Inventor : Robert H. Goddard (USA), considered as father of modern rocket propulsion.

**Rubber (waterproof)**, 1819. Inventor : Charles Macintosh (Scotland) (1766-1843). First experiments in Glasgow. Rubber introduced into Europe in 1736.

**Rubber (vulcanised)**, 1841. Inventor : Charles Goodyear (U.S.) (1800-60).

**Rubber (tyres)**, 1857. Inventor : Thomas Hancock (England) (1786-1865). Introduced solid rubber tyres for vehicles (1847) (see also bicycle).

**Rubber (latex foam)**, 1928. Inventor : Dunlop Rubber Co. (England). Team led by E.A. Murphy at Fort Dunlop, Birmingham, England.

**Safety Pin**, 1849. Inventor : William Hunt (U.S.). First manufactured in New York City.

**Sewing Machine**: Fundamental principle, double-pointed needle invented by Charles Fredrick Wiesenthal (U.S.), 1755. First patent in England by Thomas Saint, 1790. First machine put to factory use invented by Barthelemy Thimonnier (France) (1793-1854), patented in 1830. The eye pointed needle and double-lock stitch invented by Walter Hunt of New York 1832, but never patented. Elias Howe (1819-67) of Spencer, Mass, developed his machine independently (not aware of Hunt's work), patented in.,1846. Earliest practical domestic machine invented by Isaac M. Singer (1811-75) of Pittstown, New York, 1851.

**Ship (sea-going)**, c. 2500 BC. Inventor : Egyptian ships traversed Eastern Mediterranean sea.

**Ship (steam)**, 1775. Inventor : J.C. Perier (France) (1742-1818). First trail on the Seine river, near Paris, France.

**Ship (turbine)**, 1894. Inventor : Hon. Sir Charles Parsons (England) (1854-1931). *S.S. Turbinia* attained 34.5 knots on first trial.

**Silicones**, 1904. Inventor : Prof. F.S. Kipping (England).

**Silk Manufacture**, c. 50 BC. Inventor : Reeling machines devised, China. Silk mills in Italy, c. 1250, world's earliest factories of any kind.

**Skyscraper**, 1882. Inventor : William Le Baron Jenney (U.S.). Home Insurance Co. Building, Chicago, Illinois, 10-storey (top 4 steel beams).

**Slide Rule**, 1621. Inventor : William Oughtred (England) (1575-1660). Earliest slide between fixed stock by Robert Bissaker, 1654.

**Spectacles (or eyeglasses)**, c. 1286. Inventor : Venice, Italy (convex). Concave lens myopia not developed till c. 1450.

**Spinning Frame**, 1769. Inventor : Sir Richard Arkwright (England) (1732-92).

**Spinning Jenny**, 1764. Inventor : James Hargreaves (England) (d. 1778).

**Spinning Mule**, 1779. Inventor : Samuel Crompton (England) (c. 1753-1827).

**Steam Engine**, 1698. Inventor : Thomas Savery (England) (c. 1650-1715).

**Steam Engine (piston)**, 1712. Inventor : Thomas Newcomen (England) (1663-1729).

**Steam Engine (condenser)**, 1765. Inventor : James Watt (Scotland) (1736-1819).

**Stirrups (metal)**, c. 550. Inventor : Ancient Avars. Possibly originated in the eastern steppes of Asia.

**Steel Production**, 1885. Inventor : Henry Bessemer (The Steel Man) (England) (1813-98). At St. Pancras, London. Cementation of wrought iron bars by charcoal contact known to Chalybes people of Asia Minor, c. 1440 BC.

**Steel (rustless or stainless)**, 1913. Inventor : Harry Brearley (England). First cast at Sheffield, England (August 20). Knapp patent, October 1912 for chromium carbon steel; failed to recognise corrosion resistance.

**Stethoscope**, Inventor : Dr. William Stokes (England) (1804-78).

**Streetcar (railed)**, 1550. Inventor : Rail mining tracks, Lieberthal in Alsace region of France.

**Streetcar (electric)**, 1879. Inventor : Ernst Werner von Siemens (Germany) (1813-92). Earliest permanent self-propelled public streetcar at Lichterfelde in Berlin, Germany, 1881. Demonstration at Berlin trade exhibition over 300 yards, May 31, 1879.

**Submarine**, 1776. Inventor : David Bushnell of Saybrook, Connecticut (U.S.).

**Synthesizer**, 1964. Inventor : Dr. Robert Arthur Moog (USA).

**Tank (military)**, 1914. Inventor : Sir Ernest Dunlop Swinton (England) (1868-1951). Built at Leicester, England. Tested in September 1915.

**Telegraph**, 1837. Inventors : Sir William Cook (1806-79), Sir Charles Wheatstone (England) (1802-75). Demonstrated on 25th July 1837 between Euston and Camden Town in London.



**Telegraph Code**, 1837. Inventor: Samuel F.B. Morse (U.S.) (1791-1872). The real credit belonged largely to his assistant, Alfred Vail (U.S.).

**Telephone**, 1876. Inventor : Alexander Graham Bell (U.S.) (1847-1922). First exchange at Boston, Massachusetts, 1878.

**Telescope (1st refracting)**, 1608. Inventor : Hans Lippershey (German-Dutch lensmaker). Demonstrated his invention called 'kijker' (meaning 'looker' in Dutch) before Dutch parliament on 2nd October 1608.

**Time Recorder**, 1890. Inventor : Harlow Bundy (USA).

**Tractor (1st gasoline/petrol powered engine)**, 1892. Inventor : John Froelich (U.S.). Completed in Iowa (September 6 1892).

**Tractor (Caterpillar)**, 1900. Inventor: Benjamin Holt (U.S.).

**Transformer (induction coil)**, 1842. Inventor : William Stanley, Jr. (U.S.).

**Transistor**, 1948. Inventors : John Bardeen, William Shockley and Walter Brattain (U.S). Researched at Bell Telephone Laboratories. First application for a patent was by Dr Julius Edgar Lilienfeld in Canada in October 1925.

**True Nature of Combustion**, 1789. Discoverer : Antoine Laurent Lavoisier (France).

**Tungsten**, 1783. Inventors : Juan José Elhuyar Lubize and Fausto de Elhuyar (both brothers) jointly discovered Tungsten (Spain).

**Typewriter**, 1864. Inventor : Peter Mitterhofer (1822-1893) (Austria). First practical patent by Christopher Soles (U.S.) (1868).

**Uranium**, 1841, Discoverer: Martin Heinrich Klaproth (1743-1817) (Germany).

**Vaccination**, 1796. Inventor : Dr. Edward Jenner (England).

**Variable Wing**, 1956. Inventor : Sir Barnes Neville Wallis (England). First military application in U.S. F-111 Jet Fighter, 1964.

**Vitamin A**, 1913. Discoverers : Elmer V. McCollum and M. Davis (USA).

**Vitamin B**, 1916. Discoverer : Elmer V. McCollum (USA).

**Vitamin C**, 1920. Discoverers : Albert Szent-Györgyi and Charles Glen King (USA).

**Vitamin D**, 1920. Discoverer : Sir Edward Mellanby (USA). He also studied role of Vitamin D in preventing Rickets in 1919.

**Vitamin E**, 1922. Discoverer : Sir Herbert McLean Evans (USA).

**Vitamin K**, 1929. Discoverers : Henrik Dam (Denmark) and Edward Adelbert Doisy (USA).

**Washing Machine (electric)**, 1907 (date not exact, estimated). Inventor : Controversial and exact inventor is unknown. However, Hurley Machine Company of Chicago (U.S) produced first model of electric washer called "Thor" based on design by Alva J. Fisher, (1910).

**Watch (self-winding)**, 1791. Inventor : Abraham-Louis Breguet (France). Rocker Pedometer action.

**Welder (electric welding)**, 1877. Inventor : Elisha Thompson (U.S.) (1853-1937).

**Wheel**, c. 3800-3600 BC. Inventor : Sumerian civilisation. Spokes as opposed to solid wheels introduced c. 1900 BC.

**Windmill**, c. 600 AD. Inventor : Persian corn grinding, oldest known port mill, 1191, Bury St. Edmunds, England.

**Writing**, c. 3400 BC. Inventor : Sumerian civilisation. Earliest evidence found at Warka in Iraq.

**Xerography**, 1938. Inventor : Chester Floyd Carlson (U.S). First photocopier machine marketed in U.S. in 1950.

**X-ray**, 1895. Inventor : Wilhelm Conrad Roentgen (Germany). University of Wurzburg (November 8).

**Zeppelin**, (Rigid Airship) 1899. Inventor : Ferdinand von Zeppelin (Germany).

**Zero (in number system)**, c. 600. Inventor : Anonymous (India). (Absolute zero temperature; cessation of all molecular energy, 1848, William Thompson and Lord Kelvin, England).

**Ziggurats**, c. 2000 BC. Inventors : Sumerians. Earliest staged towers at Ur in Iraq.

**Zip Fastener**, 1893. Inventor : Whitcomb L. Judson (U.S.). First practical fastener or modern zipper invented in U.S. by Gideon Sundback (Sweden) in 1913.

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