



*Development of  
Industry*

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## **Meaning**

Industry is the skill of making other products from raw materials.

## **Early Sources of Energy**

Energy is the power that can be used to provide heat and drive machines. It is also the ability to do work or force that produces motion.

## **Wood**

First source of energy to be discovered. It developed after the discovery of fire by man.

### **Uses of Wood**

1. To make fire and therefore provide heat.
2. Cooking food
3. For hunting, to scare and drive wild animals into pit-traps or towards a cliff.
4. To bake clay pot and various tools
5. Provided light at night
6. Smelting iron
7. It helped to provide heat, which heats water to provide steam power for steam engines during industrial revolution.

## **Advantages of Wood Energy**

- a. Wood is readily available
- b. Wood is also cheaper
- c. Wood is also a renewable source of energy.

## **Disadvantages of Wood Energy**

- a. Continuous use of wood leads to deforestation and desertification.
- b. To produce energy, a lot of wood is required. Wood creates a limited amount of energy.
- c. Smoke from wood pollutes environment.

# Wind

Wind is air in motion

## Uses

1. Wind is used to drive or propel sailing ships
2. It is also used to turn windmills, to grind grain and process food
3. To pump water from the ground
4. To generate electricity
5. To winnow and dry grains.

# Harvesting Wind Energy





## **Advantages of Wind Energy**

- I. It is cheap
- II. It is readily and freely available
- III. It does not pollute environment

## **Disadvantages of Wind Energy**

- I. It is irregular and unreliable since it relies nature.
- II. The intensity of wind also keeps fluctuating and therefore it's unreliable

# **Water**

When water falls over cliff, it generates energy which is then harnessed by man for several uses.

## **Uses of Water Energy**

- I. To grind grains into flour
- II. To turn spinning machines in textile and paper industries.
- III. Water powered machines were used to make copper pots, weapons of war and to sharpen tools
- IV. In the 19th century water energy was used to turn turbines to produce hydro-electricity.

# Spinning machine



## **Advantages of Water Energy**

- i. Water energy is relatively cheap.
- ii. It is readily available.
- iii. It is a clean source of power, it does not pollute environment.
- iv. Water energy is easy to tap.

## **Disadvantages of Water Energy**

- Water energy is unreliable especially during dry weather, when water levels drops

# Uses of Metal in Africa

1. The use of stones to make tools was succeeded by use of metal
2. The period when man used metals to make items, in Africa is known as the 'age of metals' or the metallic age

## Advantages of metals over stones

- a. Metals does not break easily, therefore it's durable.
- b. The cutting edges of metal can be sharpened.
- c. Broken metal objects can be smelted down and used again to produce a new commodity.
- d. Molten metal can be heated and cast into varying shapes with different designs.

## **Gold**

- Gold was the first metal to be discovered by man and used in its natural state
- It was found along river beds or on the earth surface

## **Uses of Gold**

- i. Gold was used to make ornaments or jewellery e.g. bracelets, rings and bangles.
- ii. To make utensils e.g. plates, cups, vases and bowls.
- iii. It was also used to decorate knife handles and headgear.
- iv. To make coins
- v. It was also used as a grade item in central and West Africa.
- vi. Used as a measure of wealth in Egypt
- vii. It was also used as a medium of exchange
- viii. It was used for religious purposes, to make ritual tools in altars.



## **Advantages of Gold**

1. Gold is easily found on earth's surface and in relatively pure form.
2. It is malleable and can be made into desired shapes easily
3. It is also beautiful in appearance and attractive and can be used to make various products.

## **Disadvantages**

1. Gold is a soft metal and tools made from it bend easily.
2. It was heavy
3. It cannot be found everywhere

# Copper

- Copper is a soft durable metal
- It was the first metal to be used to make tools by man, since it is soft but hard en make tools.
- Copper was hardened by mixing it with zinc to form brass and with tin to form bronze

## Uses of Copper

- i. To make ornaments e.g. bangles, chains, needles etc.
- ii. It was used as a medium of exchange in form of copper bars.
- iii. Copper was used to make utensils, vessels and pots.
- iv. It was used as a trade commodity.
- v. To make alloys and tough mixtures e.g. bronze and brass.
- vi. Copper was used to make tools e.g. axes, chisels and fishhooks.
- vii. To make statues, plaques and helmets
- viii. To make weapons e.g. arrowheads, spearheads, shields, swords and daggers.



# **Bronze**

Bronze is an alloy (mixture) of tin and copper. This makes it harder than copper.

## **Uses of Bronze**

- a) To make weapons.
- b) To make tools
- c) To make kitchen utensils
- d) To make religious objects
- e) To make statues
- f) To decorate art scenes, masks of royal ancestors, nobles and warriors.
- g) Bronze was also used in trade
- h) To make ornaments e.g. Bracelets rings and anklets
- i) It was also used as a store of wealth.

## **Disadvantages of Bronze**

1. The metal is soft and tools become blunt quickly and require constant sharpening.
2. Bronze was expensive
3. It was difficult to get an appropriate proportion of each of the two metals.
4. Supplies of bronze depended on trade and trade was sometimes disrupted by war

# Iron

Iron is the most used metal by mankind compared to gold, copper, or bronze.

The first people believed to have learnt and smelt iron are the Hittites of Turkey.

There are two theories that explain the spread of iron across the world i.e. :-

1. The diffusion theory :- states that iron knowledge started in North Africa and later spread to rest of the continent of Africa.
2. The independent theory :- states that iron knowledge started distinctively in individual areas across the continent of Africa

# Factors that led to the spread of iron working skills in Africa

1. Trade between Africa and Mesopotamia and between North African and West African traders.
2. Through warfare e.g. As the Hittites from Turkey invaded Egypt
3. Development of Agriculture as better tools for farming were made
4. Travelers and messengers gave and also received gifts of iron.
5. Through Migration as the Bantus migrated from the Congo basin and they spread iron working skills to West, Central and Southern Africa.

# Uses of Iron

- 1) Iron was used for the production of stronger weapons such as spears, daggers and arrows.
- 2) To make farm implements such as hoes, axes and machetes.
- 3) To make household items e.g. Knives, bowls and cooking pots.
- 4) Iron was also used as a medium of exchange
- 5) As a measure of wealth
- 6) It was also used as a commodity of trade
- 7) To make razors and ornaments
- 8) Iron was used to manufacture steel which is hardened iron exposed to high heat temperatures

## Effects of iron Working

- 1) Iron contributed to advancement in Agriculture with better tools to clear large forests cultivate.
- 2) With improved farming tools crop production increased leading to high population.
- 3) Iron working led to division of labour and specialization.
- 4) Iron working facilitated movement and migration of people.
- 5) It increased warfare and inter-community conflicts.
- 6) It led to empire building e.g. Ghana Buganda.
- 7) It enhanced trade as demand for iron ore and iron tools arose.
- 8) It led to rise of urban centers e.g. Merowe, Cairo.
- 9) It led to the decline of use of other metals e.g. Copper and bronze.

# Industrial Revolution in Europe

- ❑ Industrial revolution refers to dramatic change from small scale industrial workshops to factory production that occurred in Europe in the 19th century.
- ❑ It also refers to radical changes in industry, transport, banking and technology which came up because of the use of various sources energy and discovery of iron and steel.

# Characteristics of Industrial Revolution

- 1) Use of machines instead of human and animal labour.
- 2) Rise of factory system.
- 3) Production of goods in large quantities
- 4) Change in living styles.
- 5) Use of steam power as a source of energy
- 6) Increased use of iron and steel
- 7) Development of better forms of transport
- 8) Increased population
- 9) Trade union movements came up.
- 10) Trade increased
- 11) Application of scientific knowledge in industry.



# Uses of various Sources of Energy in the Industrial Revolution

## Coal

- Coal is obtained from underground or surface mines.
- Coal is formed after decomposition of vegetation over a long period

There are three types of coal.

- a. Hard and black (anthracite)
- b. Soft (bituminous)
- c. Very soft (sub bituminous and lignite)

Coke (a product of heated coal) was used to smelt iron.

# Uses of Coal

- 1) It was converted into coal tar which was used for smelting iron
- 2) It was used to heat water to produce steam
- 3) To drive steam engines in factories
- 4) To provide lighting
- 5) To drive locomotives or train
- 6) It was used in manufacture of dyes and pharmaceutical products and plastics.

# Disadvantages of Coal

1. It is bulky and expensive to mine and to transport
2. It is a pollutant.
3. It is a non- renewable source of energy
4. It corrodes building
5. It causes damage to human lungs
6. It has low energy value. Its only 15% of the energy released is converted into power
7. Coal mining was risky and miners lost their lives when a mine collapsed and buried them alive

## **Petroleum/Oil**

- Oil is formed from the remains of small animals and plants that died millions of years ago.
- Oil has been used as far back as 5000 B.C.
- In the 19th century Andrew Drake an American was able to drill oil sites.
- Later petroleum or crude oil was refined to acquire
  - i. - Paraffin
  - ii. - Petrol
  - iii. - Diesel oil
  - iv. - Grease
  - v. - Cooking gas
  - vi. - Aviation oil
  - vii. - Tar.

# Uses of Oil

- I. For lighting and cooking as it generates electricity
- II. Tar (bitumen) is used to tarmac roads
- III. Greasing of metals in industries
- IV. To power vehicles and aeroplane engines
- V. Some petroleum chemicals are used to make drugs, synthetic fibers, fertilizers and plastics
- VI. It produces useful products like fuel, oil and cooking gas.

# Advantages of Oil

1. It has a wide variety of uses
2. It is clean as compared to coal
3. It is easy to transport unlike coal
4. It is cheap compared to other sources of energy
5. It has high calorific value
6. Owing to its accessibility it is utilized for various purposes conveniently.

# Disadvantages of Oil

1. Causes a lot of environmental pollution through oil spillage and environmental degradation
2. Extracting oil is very expensive. Oil is very expensive for the countries that are not endowed with it
3. It's a non- renewable source of energy
4. Outbreak of fires as it is transported leads to loss of lives

# Steam

- Steam is gas or hot water vapour that is released by boiling water
- Coal was used in the production of steam during the industrial revolution.
- In the 16th century a British Thomas Savery built a steam engine that pumped water out of coal mines.
- In 1712 Thomas Newcomen tried to improve Savery's design though it was unsuccessful.
- In 1764 James Watt improved Newcomen's engine, and produced a more efficient one
- By 1800 about 320 of his engines were being used in Britain
- In 1801, Richard Trevithick fitted one of Watt's engines to a vehicle. In 1804 he produced a steam driven locomotive.
- In 1825 George Stephenson invented the first steam locomotive, the Rocket.



## Uses of Steam

1. It was used in steam powered locomotive and ships.
2. To turn turbines that generated power for industrial use.
3. To provide heat for homes and other places during the cold season.
4. To drive heavy machinery in factories.
5. Massive temple doors in Egypt were opened using steam.
6. It was used to pump water out of coal mines and to factories
7. Steam was also used to drive machines in the textile industry by driving spinning and weaving machines.

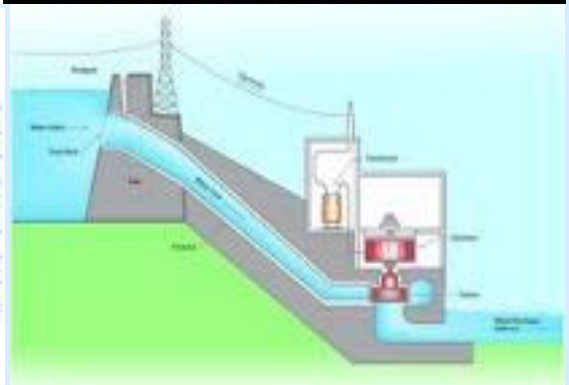
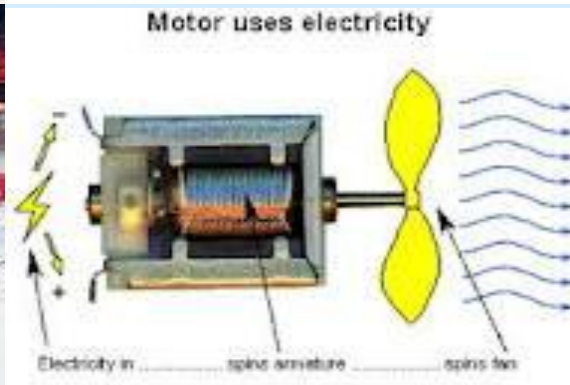
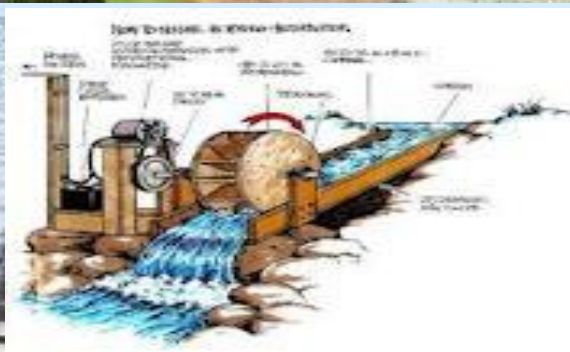
## Electricity

- In 1831, Michael Faraday a British invented an electric dynamo
- The dynamo used water, coal, oil and steam to produce electricity
- Electricity can also be generated from geothermal, nuclear and solar energy.

## Uses of Electricity

1. It is used in communication industry where electric signals are used in telephones, radios and television
2. Powering machines in factories
3. Cooking and heating
4. Lighting
5. In transport especially in electric trains and cars.

# Electricity Production



# Advantages of Electricity

1. It's a clean source of energy
2. Its renewable
3. It is convenient and efficient
4. The power supply is easily controlled by use of switches
5. Has various sources of production e.g. water, petrol and atomic, nuclear and geothermal generated machines.

## Disadvantages of Electricity

1. It is not stored for it must be used as it is being generated
2. It relies on natural supplies e.g. Water
3. It can be dangerous to property and being If not properly handled
4. Its generation and distribution is very expensive
5. Installation and maintenance of electricity require trained personnel
6. Electricity can only be transmitted over relatively short distances, about 64 km.

# Other sources of energy

## **Atomic energy**

It was discovered by Antoine Henri Beckquerel  
{1852-1908}

Atomic or Nuclear energy is produced when  
atoms of radioactive elements such as  
uranium is split.

# uses

1. Invent the nuclear reactor
2. Making of atomic weapons
3. Generation of electricity
4. Powering submarines and locomotives
5. Production of radioactive elements for medical use

## **Advantages of Atomic Energy**

Cheap source of energy

Helps in industrial developments

## **Disadvantages**

- ✓ Nuclear weapons can be fatal to human beings
- ✓ Radioactivity endangers animal & plant life & crops



# Solar energy

This energy is obtained directly from the sun

## Uses:

1. Drying of agricultural products
2. Distilling of salty water to get salt crystals
3. Heating water in homes & industry
4. Heating & lighting buildings
5. Cooking using solar cookers
6. Irrigating using solar water pump
7. Powering of satellites in space

# Solar Panels



## **Advantages of Solar**

1. Clean available source of energy
2. It's a free {natural} non-pollutant & inexhaustible source of energy

# Uses of Iron and Steel, during the Industrial Revolution

With the developments in the industrial revolution the use of smelted iron increased.

## Uses of Iron

1. Production of water pipes and ploughs
2. Production of machines for textile industries
3. To produce steam engines
4. For building trains, railway lines, ships and bridges.

## Disadvantages of Iron

1. It was too heavy to transport
2. It was not strong for making heavy machinery
3. Iron could easily rust

## Uses of Steel

1. Construction of storied buildings to improve stability.
2. Making utensils like sauce pans and food containers
3. Roofing houses
4. Construction of Railway lines, bridges, c ships and trains
5. To manufacture machinery in agriculture a... industries
6. Manufacture of surgical tools e.g. blades and needles.

# Industrialization in Britain

Britain was the first country in Europe to industrialize.

## Reasons why Britain was the first country to industrialize

1. Availability of sources of energy for use in industries e.g. coal
2. Britain had established cottage industries which provided a basis for industrial growth
3. Britain had acquired new skills in science and technology.
4. Britain had ready markets for her industrial products within the British Empire and her large Population provided domestic market.
5. Availability of labour from the peasants displaced during the Agrarian revolution.

6. Britain had a well developed transport system i.e. land and water transport.
7. Skilled labour for the industries was available
8. She was politically stable
9. Britain's policy of free trade i.e. she had no customs barriers
10. Britain also had well developed banking and insurance systems. Banks gave loans and insurance system gave security against losses or accidents.



11. Britain protected her trading ships from pirates and competition, because of her strong navy who guarded her trade routes.
12. Rich businessmen invested in the industries.
13. There existed external markets in Britain's many colonies which were also a source of raw materials for the industries.
14. Agrarian Revolution increased food for industrial workers and raw materials for industries.
15. Iron-ore for heavy industries was available.

## **Industrialization in Continental Europe**

Industrial revolution had started in Britain from about 1750 and spread to continental Europe.

### **Factors that led to the rapid industrial growth in Europe**

- 1) By 1870 large scale industries had grown rapidly because:
- 2) Existence of domestic and external market for manufactured goods from her high population
- 3) Existence of banking and insurance services: - banks gave loans to industrialists
- 4) High population provided labour required in the industries both skilled and unskilled.
- 5) Rich merchants invested in industry. Britain also gave loans to other countries like Belgium.

- 6) Improved transport e.g. better roads, railway and water transport
- 7) There was raw materials produced because of the Agrarian Revolution.
- 8) There was political stability in continental Europe by 1870.
- 9) Government support of industrialization.
- 10) Countries in continental Europe had various sources of Energy that aided industrialization e.g. coal, steam power and electricity.
- 11) New skills in science and technology. They sent their people to Britain. British technicians were also invited to Belgium and Germany.

# Effects of industrial revolution in Europe

## Economic effects

- 1) Development of machinery
- 2) Development of local & international trade
- 3) Industrial revolution boosted the transport & communication systems
- 4) Urbanization
- 5) Industrial revolution enabled European nation to acquire wealth
- 6) Exploitation of natural resources due to industrial revolution
- 7) High demand of agricultural raw materials
- 8) Industrial revolution promoted science & technology
- 9) Development of legislations to enhance social reforms e.g. education etc as a result of poor working & living conditions

- 10) There were new forms of disputes i.e. industrial disputes. Trade unions were formed for the welfare of workers
- 11) Industrial revolution led to scramble for colonies in Africa, to be a source of raw materials and a market for their manufactured goods.
- 12) There was pollution of the environment from industrial emissions and factory effluents
- 13) Industrial revolution led to scientific inventions
- 14) Industrial revolution led to improved medical services.

## Social effects

1. Rural-urban migration
2. Poor sanitation and refuse disposal due to high population
3. Pollution
4. Unemployment
5. Increase of demand of services eg hotel, post offices, banks & insurance services
6. Rise of social classes
7. Severe gender inequality

## **Political effects**

1. It led to the scramble & partition of Africa
2. Led to the rise of Marxism

# The Scientific Revolution

## Definition

Scientific revolution refers to sudden changes in the field of science when many discoveries were made, which increased man's knowledge and understanding about himself and the universe.

## Scientific Inventions

- a. Ancient civilizations of Egypt, Greece, China and
- b. India greatly influenced early scientific development



# Egyptians

- I. They were famous mathematicians and developed arithmetic e.g. fractions and used this.
- II. knowledge to construct tombs and pyramids.
- III. Egyptians also discovered geometry.
- IV. They were also skilled in medicine and surgery which enabled them to preserve or mummify dead bodies.
- V. They were also good in architecture.
- VI. Were involved in astronomy.
- VII. They invented the 365 day calendar.

# Chinese

- I. They were great astronomers
- II. They made cloth from silk
- III. The Chinese also developed acupuncture skills
- IV. They invented paper making
- V. The Chinese also invented the making of gunpowder
- VI. They also made a calendar
- VII. They also made a magnetic compass.

# Indians

- a. The Indians invented the decimal system
- b. They were great astronomers
- c. They introduced the Zero digit
- d. In medicine they found the cures for snake bites and leprosy
- e. The Indians were also able to perform simple operation and treat broken bones
- f. They also contributed in the field of chemistry.

# The Greeks

- I. They introduced the Pythagoras theory in mathematics
- II. Contributed in geometry
- III. They invented the Archimedes principles and explained how a lever works
- IV. Archimedes also invented volumes
- V. They produced an atlas by Ptolemy.

## Arabs and Muslims

- I. They were famous mathematicians and accepted the idea of zero from the Indians
- II. They wrote medical books
- III. They developed architecture especially in building of mosques
- IV. They pioneered in making of flasks
- V. Were famous in treating small-pox, meas. and kidney ailments
- VI. They classified substances into animals plants and minerals
- VII. They contributed a lot in irrigation
- VIII. Contributed to the methods of book making.

## **Greatest Scientists in Europe**

Scientific revolution was associated with industrial revolution as efforts to solve industrial crisis this led to discoveries of new scientific fields.

### **Corpenicus (1473-1543)**

He discovered that

- The earth was one of the planets of the so system
- The earth rotated on its axis and mow around the sun once every year.

## **Realdo Columbus (1516 — 1559)**

Discovered that blood circulates between heart and the lungs.

## **Andreas Vesalius (1514 — 1564)**

Pioneered anatomy, the dissection and examination of human corpses.

## **Galileo Galilei (1564-1642)**

Made the first telescope to observe the universe and accepted the theory of Copernicus.

## **William Harvey (1578 — 1657)**

Discovered the circulation of blood with the heart as the pump.

## **Isaac Newton (1642-1727)**

Discovered

- The force of gravity
- The reflecting telescope
- That light is made up of several colours (spectrum).

## **Linnaeus (1707 — 1778)**

Contributed to the study of botany and zoology by his classification of plants and animals.



## **Benjamin Franklin (1706-1790)**

- Showed that lightening was a form of electricity.

## **Antoine Lavoisier (1743-1794)**

He showed that

- ✓ Air is made up of hydrogen and oxygen
- ✓ All chemical substances are made up of different elements.

## **Edward Jenner (1749-1823)**

He invented a vaccine for small pox.

## **John Dalton (1766-1844)**

- ✓ He discovered the atomic theory i.e. all substances are made up of tiny particles called atoms
- ✓ He also discovered and explained colour blindness.

## **Michael Farady (1791-1867)**

- ✓ He invented electricity; he was interested in the relationship between magnetism and electricity.
- ✓ 1831 he invented the electric dynamo.

## **Charles Darwin (1809-1882)**

- ✓ He explained that all living thing or species including man were a product of evolution. 1859 he published his theory of evolution in his book “the origin of species”
- ✓ In 1871 he published a second book “the descent of man”.

## **Louis Pasteur (1822-1895)**

- ✓ Showed that microbes (tiny creatures in the air) caused disease
- ✓ He discovered the process of ‘pasteurization’ for the conservation of liquid foods. His work influenced canning.

## **Joseph Lister (1827-1912)**

- ✓ He discovered the value of antiseptic in surgery .

## **William Morton (1819-1868)**

Discovered the use of anaesthesia during an operation to make patients sleep or feel less pain

## **Ronald Ross (1857 — 1932)**

Discovered that the anopheles mosquito caused malaria.

## **W.H Perkins (1838 — 1907)**

Discovered the use of artificial dyes.

## **Robert Koch (1843 — 1910)**

Discovered the microbes that cause Tuberculosis, cholera and anthrax.

## **Alexander Flemming (1843 — 1955)**

Discovered penicillin in 1928.

## **Heinrich Hertz (1857 — 1894)**

Made discoveries in the radio, other types of communication

## **Jonas Edward Salk**

Discovered the polio vaccine in 1967.

## **Dr Christian Bernard**

Discovered how to perform a heart transplant in 1967.

## **Note:**

Currently the medical scientists are researching on the cure for HI V/AIDS which is a threat to human survival.

## **American Scientists include: -**

### **Alexander Graham Bell**

Invented the telephone in 1877.

### **Thomas Edison**

Invented the electric lamp in 1879.

### **The Wright brothers**

Discovered the aeroplane in 1903.

### **Henry Ford**

Pioneered the mass production of vehicles

### **Neil A. Armstrong and Edwin E. Aldrin Jr:**

These two Astronauts landed on the moon in 1969.

# Impact of Scientific Inventions Agriculture

## Positive

- I. Food production has increased due to improvement in farming methods and animal husbandry
- II. Use of machines to replace human labour on farms, freed manpower to work in industries
- III. Discovery of canning and refrigeration helped to preserve food. This promoted farming and exportation of food
- IV. With increase in food production, the human population also increased
- V. Stimulated local and international trade
- VI. Enhanced agricultural diversification
- VII. Production of cross-breeds of animals and hybrid seeds.

# Industry

## Positive

- ✓ The discovery of steam engine led to the development of factories.
- ✓ Development of transport and communication networks
- ✓ Efficient sources of energy have been developed e.g. steam, electricity nuclear and solar energy.
- ✓ There was a rise in the standards of living.
- ✓ Communication has been revolutionized printing which has led to the spread of information and knowledge world wide
- ✓ Mass production of industrial goods has led to an increase in world trade
- ✓ Industrial earnings generate foreign exchange
- ✓ Improvement in space exploration and weather research

# Negative

- 1) Use of agricultural machinery has created unemployment
- 2) Use of some fertilizers that impoverish the soil
- 3) Some of the pesticides used in farming are detrimental to both people and animals
- 4) Consumption of chemically treated foodstuffs may lead to the emergence of incurable diseases
- 5) Some traditional crops and animals have been lost due to cross breeding and development of hybrids
- 6) Continuous use of pesticides has led to the emergence of resistant strains of pests.



# Negative

1. Use of machines in industry has created unemployment
2. Ease of spread of diseases through the use of modern transport
3. Increased pollution of the environment
4. Manufacture of destructive weapons which — a threat to world peace

# Medicine

## Positive

- 1) There has been discovery of preventive curative medicine
- 2) Discoveries in medicine have helped to avert human suffering
- 3) Vaccinations have led to controlling the spread of killer diseases.
- 4) Complicated medical cases can now be with e.g. heart, kidney and lung transplants.
- 5) Life expectancy has increased due to health
- 6) Through medical research jobs have been created
- 7) Production of advanced medical which have improved man's life e.g.
  - a. X-rays
  - b. Plastic surgery
  - c. Heart, liver and kidney transplants
  - d. Test-tube babies.

## Negative

1. Pollution of the environment through improper disposal of medical equipments e.g. syringes
2. A lot of money is needed for science research
3. Some drugs are expensive to buy
4. Has led to drug abuse.

# Emergence of World Industrial Powers

## United States of America. (U.S.A.)

### **Factors that Promoted Industrialization in U.S.A**

- 1) Occupation of USA by European immigrants who were equipped with various skills and knowledge suitable for industry
- 2) Agricultural mechanization released labourers from the farms to the industries
- 3) USA had a good transport and communication network of roads, water and railways e.g. In 1869 the great American railway was opened.
- 4) She had abundant natural resources e.g. minerals like copper, oil, coal and iron ore, forests fisheries and agriculture. These provided the raw materials for the industries.
- 5) America also enjoyed a long period of peace after its independence. This encouraged industrial growth.

- 6) Energy supply was abundant from coal, H.E.P. oil and natural gas.
- 7) Labour, skilled and unskilled was available from
- 8) the local people and the immigrant population.
- 9) The government also supported the industries by providing capital and encouraging training in industrial skills.
- 10) Ideology of development based on capitalism is a great encouragement to investors
- 11) The government encouraged scientific research and technological advancement which led USA to lead in fields of transport and communication, astronomy and medicine.

- 12) USA's foreign policy of friendly relations, isolation and neutrality in world affairs, made her to keep off in the world wars. This created an investment climate where European traders could invest in industries.
- 13) Availability of banking, insurance and managerial industries
- 14) Presence of many enterprising citizens ready to venture into new businesses
- 15) Far sighted leaders and sound planning e.g. president Franklin Roosevelt (1932 — 1944) who introduced the new deal', an economic recovery programme which restored people's confidence in banks and created employment after the depression of the 1920's and 1930's.

# Germany

## Factors which led to Industrial Development in Germany

- 1) The Zollverein: This was a customs union that united all the states and removed trade barriers. This encouraged industrialization by easing transportation of goods from one state to another.
- 2) There was political stability especially after the unification in 1871.
- 3) She had a large population that provided an internal market and the external market was available because her industrial products were of high quality.
- 4) The education system trained people in technical skills which were applied in industries.

- 5) Availability of natural resources e.g. coal, iron ore, forest, water and agriculture.
- 6) Energy was also available for the industries e.g. coal, H.E.P., and atomic energy.
- 7) She had a well developed transport and communication system of roads, canals, railways and telephone.
- 8) Finances for industrial growth were available especially from America i.e. the Marshall plan.
- 9) Government support of industry i.e. it encouraged individual investment in local industries



- 10) There were very few industrial strikes and this made investment profitable
- 11) Good labour supply e.g. Immigrants from poor areas of Europe provided cheap labour
- 12) Due to mechanization in agriculture, former agricultural workers joined the industrial labour force
- 13) Germany had a long established tradition of industrialization which the two world war'. not totally destroy
- 14) The re-unification of West and East Germans (1990) has also contributed to the economic strength of Germany.

# Japan

## Factors leading to her Industrialization

- I. Japan had a large population which provided skilled and non-skilled labour together with a market for her products.
- II. Japan got a lot of financial and technical support from USA and other western European countries especially after the Second World War.
- III. The citizens of Japan are very enterprising, and idleness is discouraged.
- IV. Availability of raw materials within and outside e.g. coal, oil, iron ore, silk, copper and cotton.
- V. She had a strong industrial base that was not damaged during the Second World War.
- VI. Energy for her industries was available

- VII. Her system of education was technical oriented and developed skills required in industries.
- VIII. Japan had a well developed transport and communication system
- IX. Political stability
- X. Production of high quality and cheap goods that have a wide market especially in Africa, U.S.A and Europe.
- XI. Investment policy:
  - a. The government encouraged industrialists to plough back most of their profits
  - b. The government and industrialists worked together in making long term industrial plans
- XII. Open-minded economic policy which eased international trading relations
- XIII. Japan has little land suitable for farming, hence the alternative is industry
- XIV. Presence of natural harbours.

# **Industrialization in the Third World**

## **South Africa**

South Africa was under white minority rule until 1994.

### **Factors that led to Industrialization South Africa**

1. Skilled manpower was available.
2. Internal market
3. Political stability after the end of apartheid
4. Natural resources were available especially minerals e.g. iron ore, lead, zinc, manganese etc.
5. Cheap labour was available among Africans in South Africa, Swaziland, Botswana Malawi.

5. Good transport network of roads water and air transport
6. Availability of sources of energy e.g. H.E coal etc.
7. South Africa produces goods of high quality which can compete with those from 1<sup>st</sup> world nations.
8. Availability of capital from export of miner
9. The government of South Africa supports industries by imposing heavy taxes on import commodities. She also encourages foreign and local investors
10. South Africa's wildlife and landscape initiated a lot of tourists, and this earns the country foreign exchange.

## Problems hindering Industrialization in South Africa

1. Long period of apartheid rule, there was violence which did not encourage investment
2. There were also industrial strikes during apartheid period.
3. There was also a lot of insecurity and scared away foreign investors
4. High levels of poverty and therefore low purchasing power for most of the population
5. HIV/AIDS pandemic has taken away industrial labour force
6. Competition from the developed countries e. Japan, South Korea, India, China and western European nations.

# Brazil

Brazil is in South America. She gained her independence from Portugal in 1882.

## **Factors that contributed to Industrialization Brazil**

- 1) Availability of sources of energy e.g. H.E.P coal and petroleum.
- 2) Improved transport and communication of roads and railways.
- 3) Brazil has a large population which provided skilled and unskilled labour and market for her manufactured goods.
- 4) Brazil established banks which provided loans to those who invested in industries.

- 5) A lot of natural resources that provided raw materials for her industries e.g. coal, iron ore, manganese, coffee, maize and forests from the Amazon region.
- 6) External financial assistance e.g. from USA and Europe
- 7) Government encouragement of industries by giving financial assistance to entrepreneurs to start new industries and to expand old ones
- 8) The 1st and 2nd world wars interrupted links with Europe. There arose a need to substitute imports which favoured domestic manufacturing
- 9) Good economic policies were adopted e.g.
  - i. Use of 5-year economic plans e.g. the plan of 1956 - 1960 under President Getulio Vargas which promoted energy, transport and industry
  - ii. Nationalization of industries
  - iii. Heavy duty on imports to protect her industries
  - iv. Provision of loans and subsidies to some industries.



## **Factors that hinder industrialization in Brazil**

- 1) Poverty i.e. The purchasing power is very low hence goods are unaffordable to the majority of the population
- 2) The government spends a lot of money in providing social services
- 3) Lack of capital which leads to inability to exploit her natural resources.
- 4) She has a huge foreign debt and therefore spends a lot of money repaying the debts.

- 5) She faces stiff competition from the industrialized nations like USA, Britain, and Japan etc.
- 6) Poor technology.
- 7) The investors repatriate profits back home and are thus leaving Brazil very poor.
- 8) The resources are owned by multinational companies and the government has no freedom to exploit them.
- 9) Brazil needs to open up her vast hinterlands i.e. most of her people live along the costal belt. leaving the hinterland sparsely population.

# India

## Factors that have contributed to Industrialization in India

1. Long historical contact with industrialized Europe from the 15th century
2. India has a good transport and communication system
3. She has various sources of energy
4. Existence of good industrial base e.g. textile and leather industries.
5. The population of India is very high, about a billion people and this provides cheap labour and a large domestic market.
6. Sound economic five year plans introduced in 1951 by Prime Minister Nehru which gave priority to agriculture and the second plan prioritized industrialization.

6. Availability of funds from U.S.A, Germany, Britain, Soviet Union and Holland
7. Establishment of banking services
8. A lot of money is spent on industrial research
9. High degree of entrepreneurship and risk undertaking by Indian nationals.
10. Considerable levels of political stability
11. The state is involved in the development of heavy industries i.e. mining, ship building, heavy machinery e.t.c
12. Aggressive marketing of her products abroad
13. Good technical and scientific education produced scientific experts in industries
14. The government supported industries by setting up protective tariffs to protect local industries from unfair competition
15. Many Indians who live abroad invest back home

# Problems facing Industrialization in India

1. The country's population is very high and a lot of money is spent on agriculture and social services.
2. There is a lot of competition from the first world, especially because most of her goods are of low quality.
3. Poverty is very high leading to low purchasing power and therefore lack of market for manufactured goods locally
4. India is also affected by natural calamities like floods, drought and cyclones that affect industrialization.
5. Under exploitation of resources due to lack of capital
6. The society is reluctant to change and this is a drawback to industrialization
7. There are a lot of political conflicts in India

# Problems hindering Industrialization in the Third World Countries

1. There is a lot of competition from the developed countries
2. Poor means of transport and communication system
3. Lack of capital to finance industrialization as they rely on agricultural products which cannot provide capital required for industrial growth. They rely on loans from developed countries.
4. The countries have poor educational systems which do not provide industrial experts. They rely on foreign expatriates who are very expensive.

5. Civil wars and border conflicts which are not conducive for industrial growth.
6. Poverty which leads to low purchasing power and therefore limits local market for manufactured goods.
7. Third world countries have poor economic policies. The governments impose high import duties and nationalization policies which discouraged foreign investors.
8. Neo-colonialism i.e. lack of economic independence. Economic resources are still controlled and exploited by the developed tries through multi-national corporations international trade.

# KCSE SAMPLE QUESTIONS



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*End* 