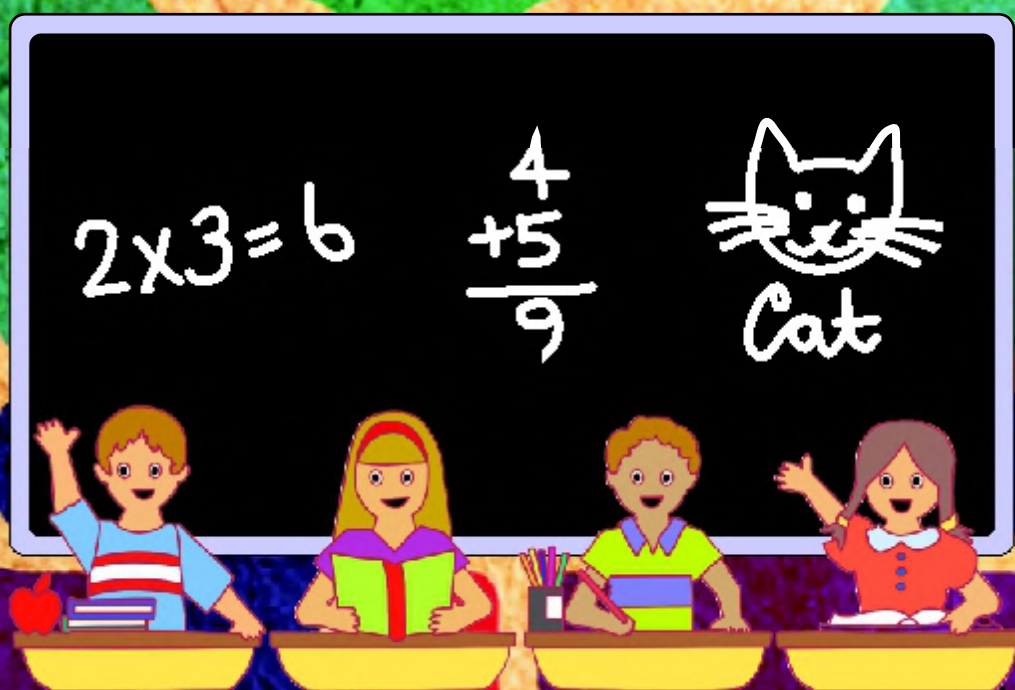


2024

**Illustrated Catalogue
cum Price list of
HUMAN PHYSIOLOGY
BIOLOGICAL &
PHYSICAL SCIENCES
publications**



HUMAN PHYSIOLOGY PHYSICAL & BIOLOGICAL SCIENCES SECTION: CHARTS & 3D MODELS		
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2.	Small Human Physiology Charts (50*70 cm)	7-8
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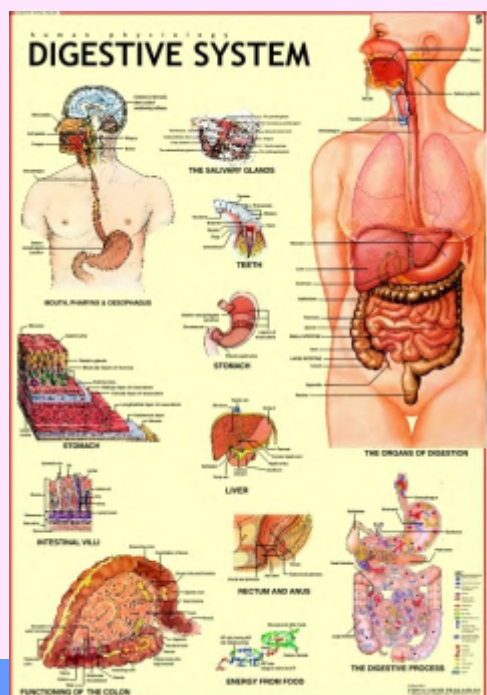
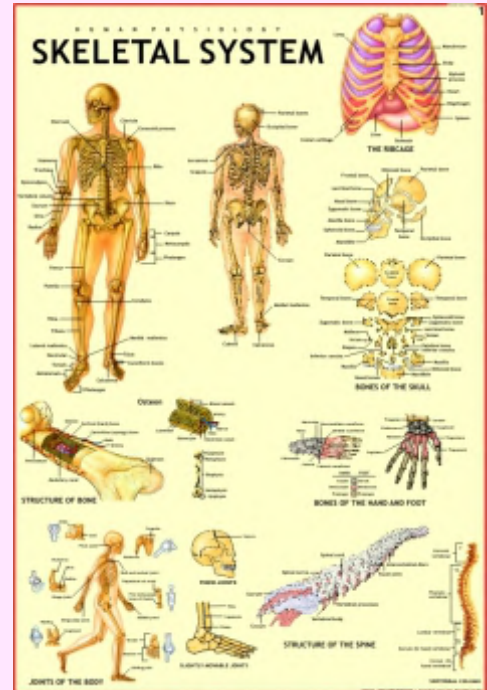
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English & Hindi

English Only | English & Gujarati | English & Marathi | English & Tamil

English & Telugu | English & Kannada | English & Urdu

1. Skeletal System
2. Muscular System
3. Circulation of Blood
4. Nervous System
5. Digestive System
6. Human Eye
7. Human Ear
8. Kidney, Skin & Excretory Organs
9. Respiratory System
10. Human Heart

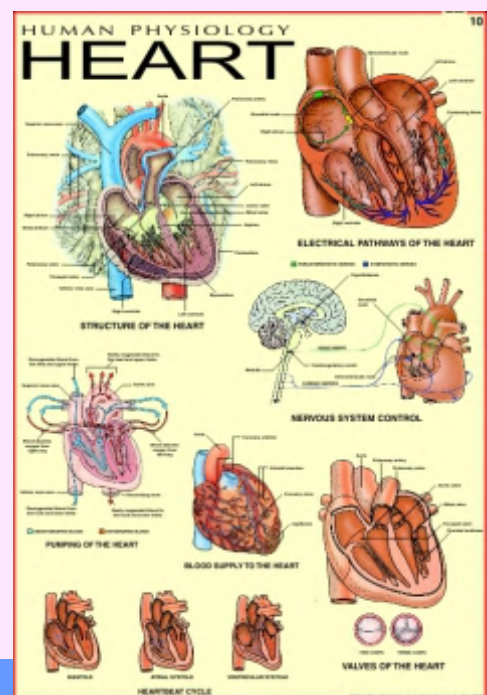
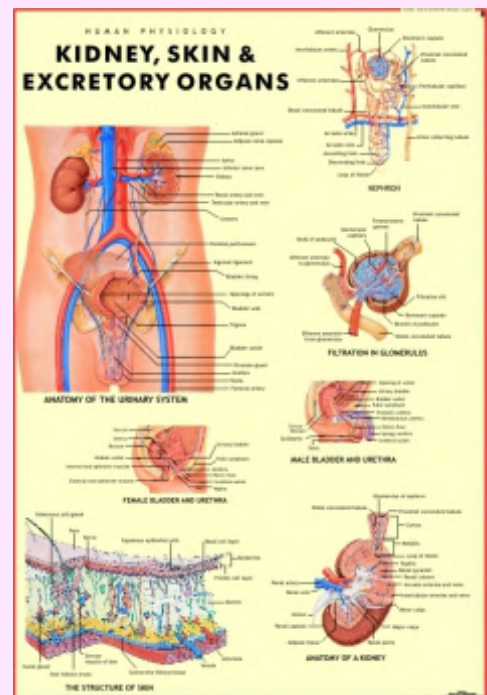
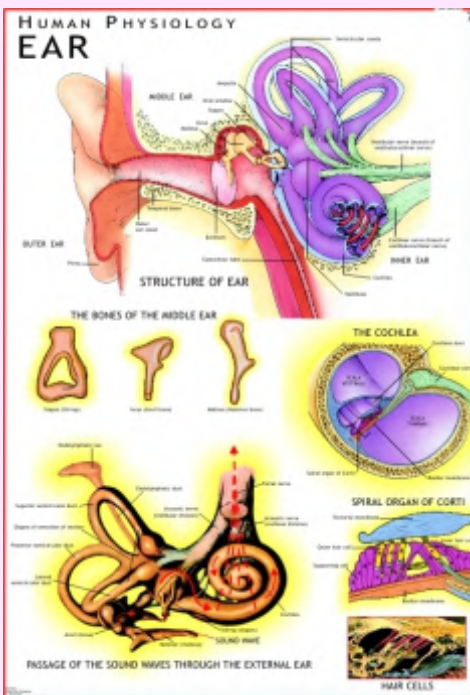
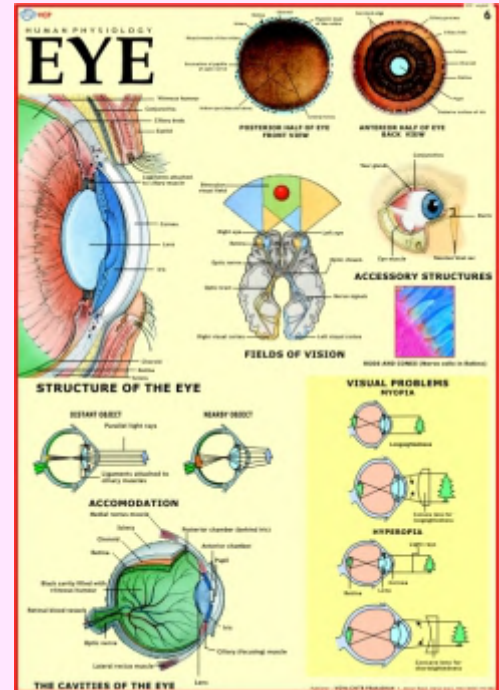


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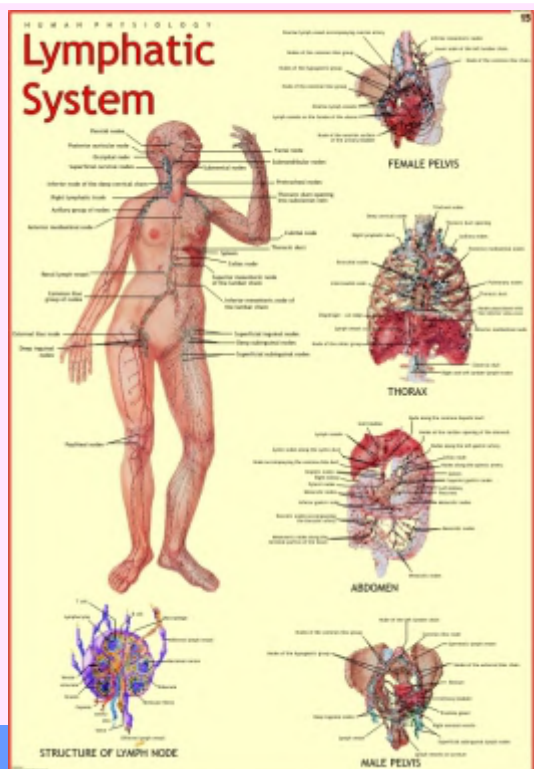
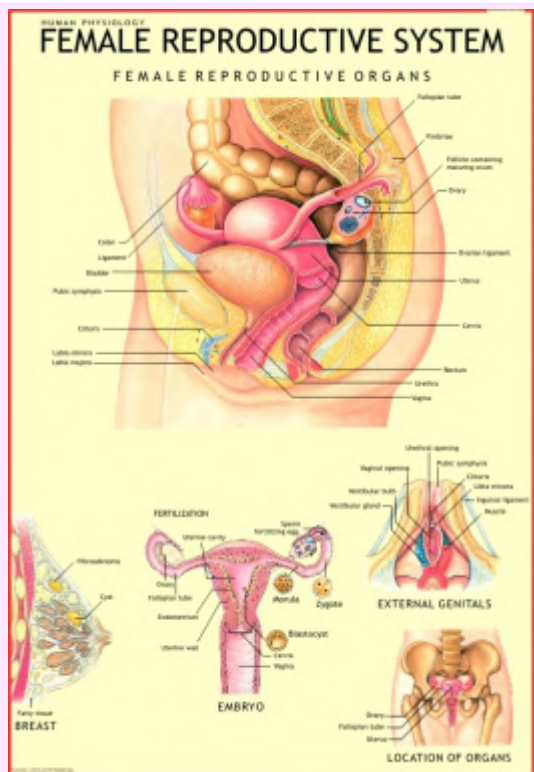
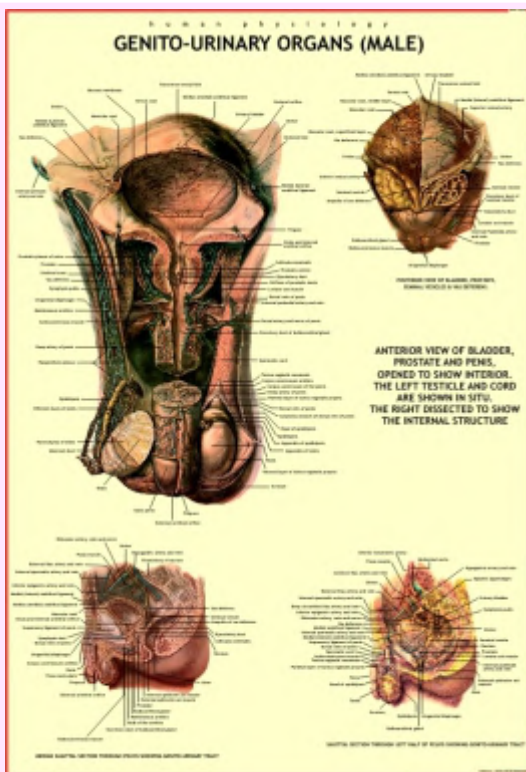
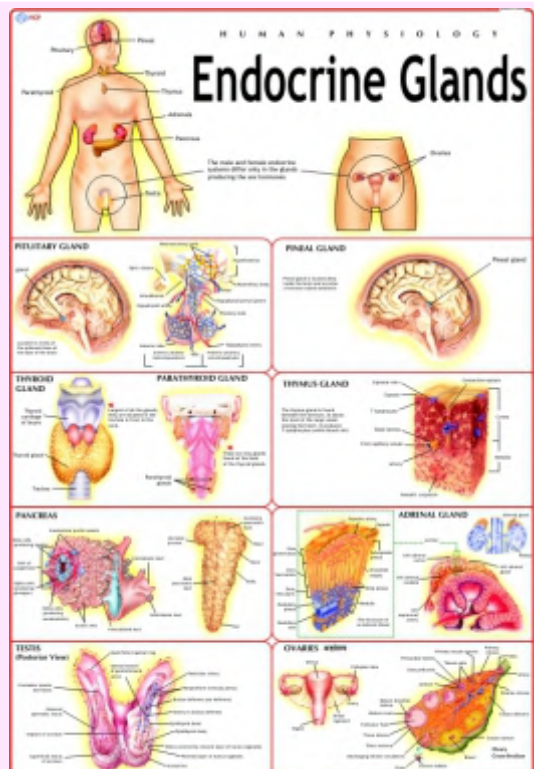


English only

11. Endocrine System (*in Tamil also*)
12. Genito Urinary Organs (Male)
13. Female Reproductive System
(*in Tamil also*)
14. Human Embryology (Early Stage)
15. Lymphatic System
16. Teeth and Dental Care.

English only

17. Human Anatomy
18. The Brain
19. Ear, Nose & Throat
20. Liver, Gall Bladder & Pancreas
21. Human Skull
22. Pregnancy

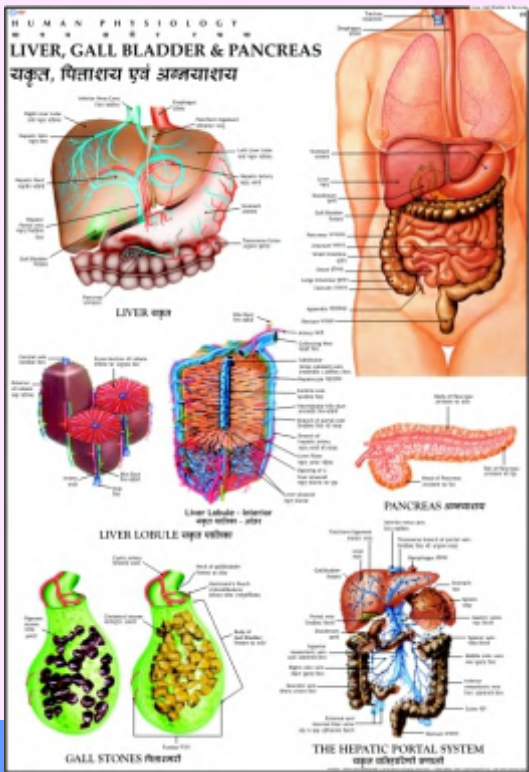
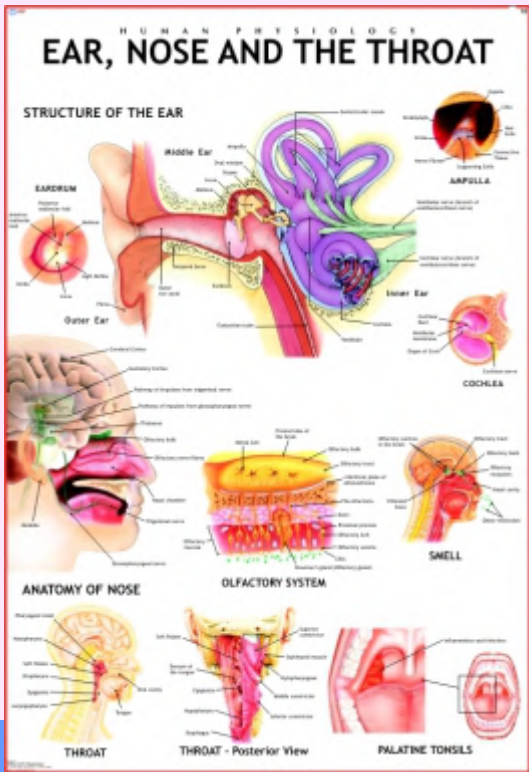
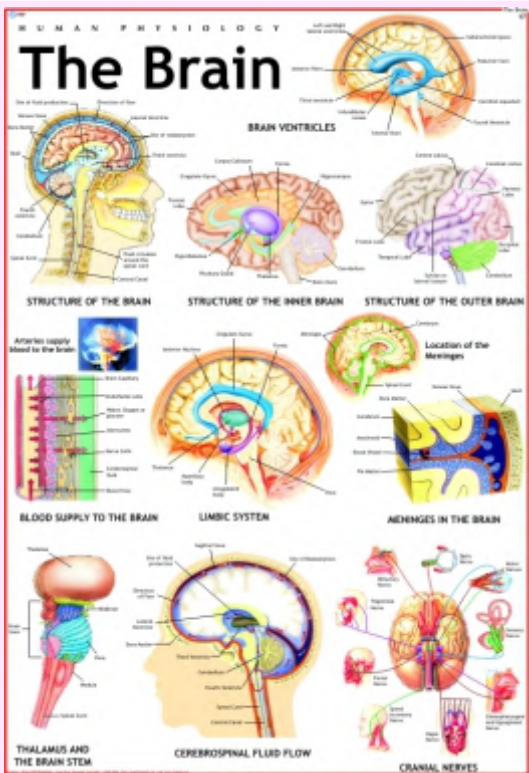
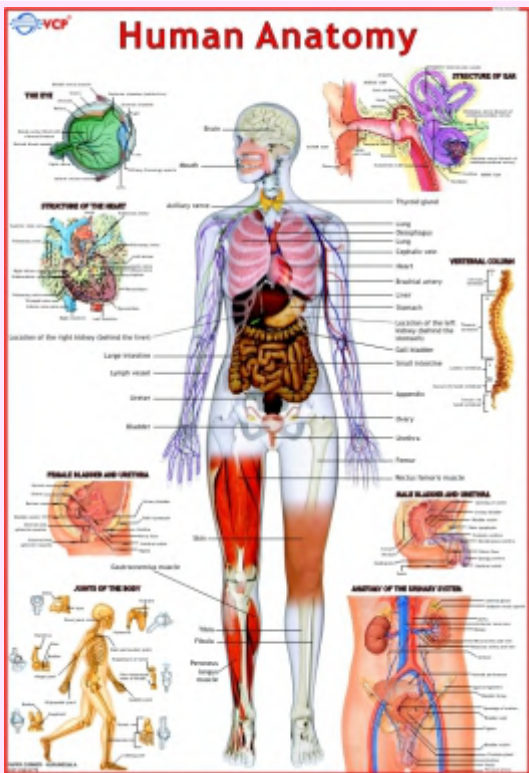
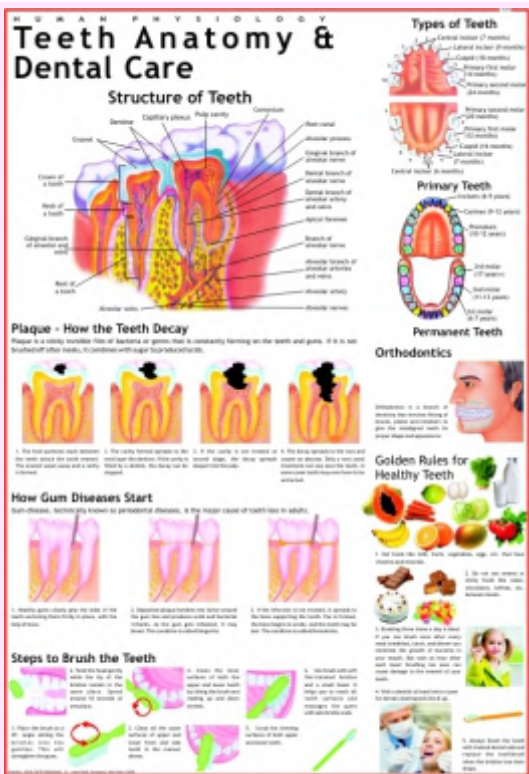


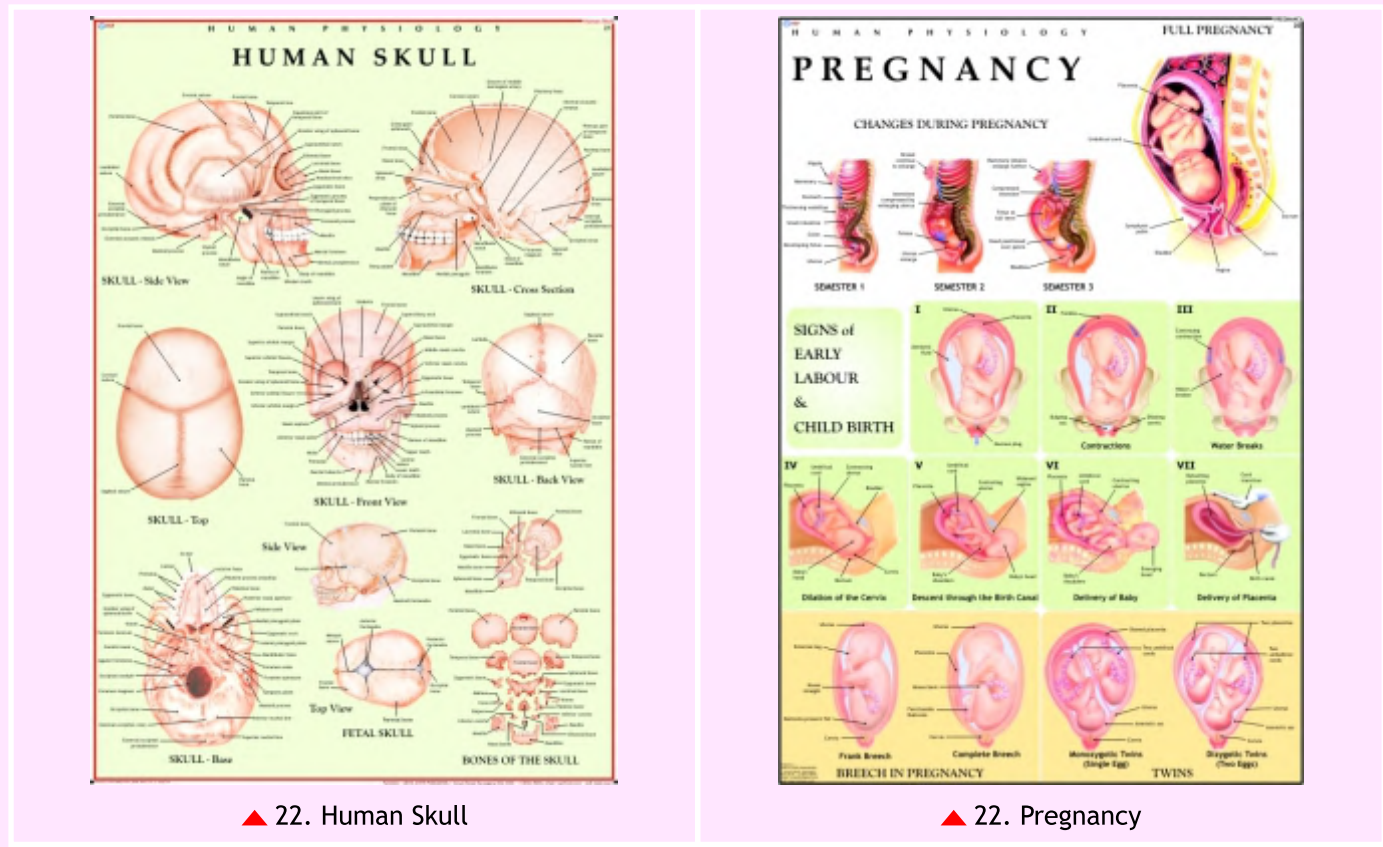
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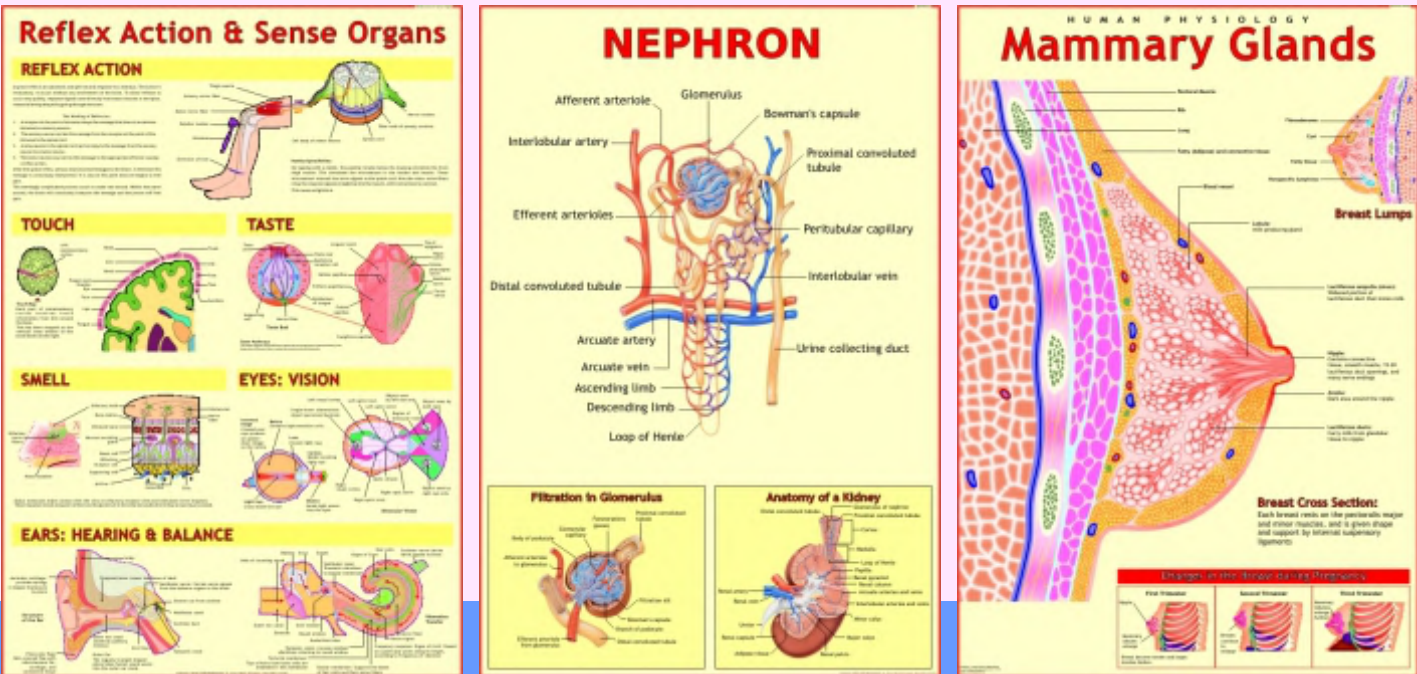
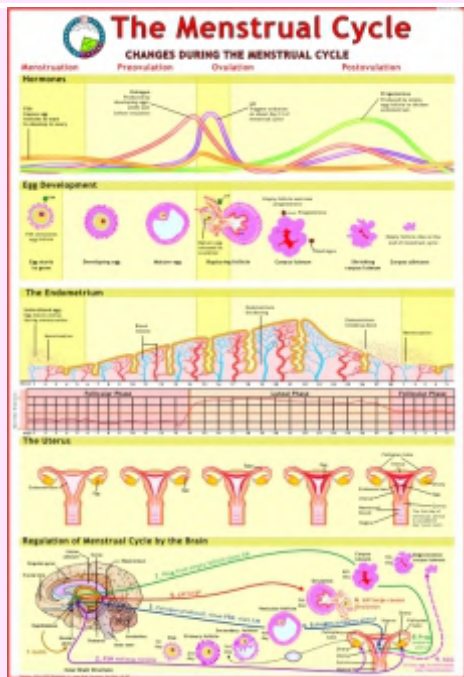




More Detailed Human Physiology Charts

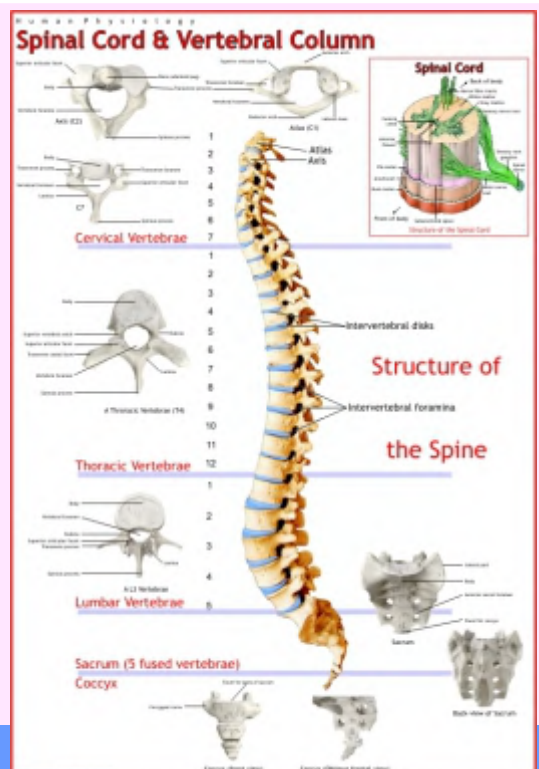
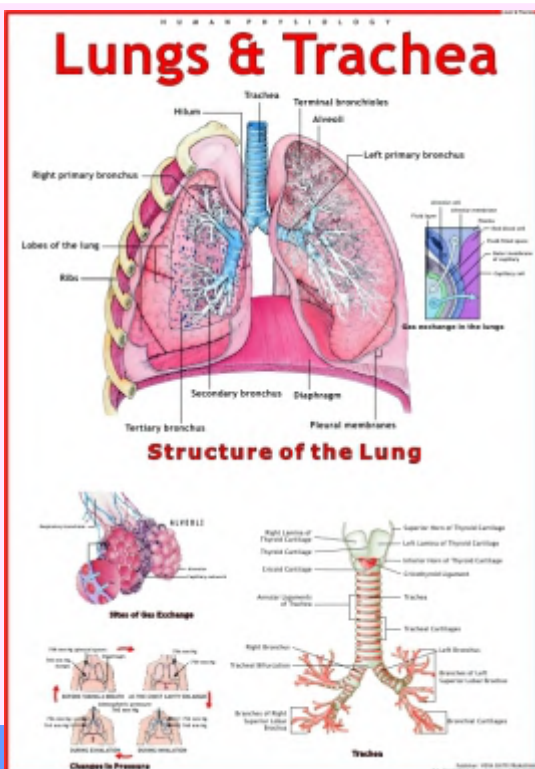
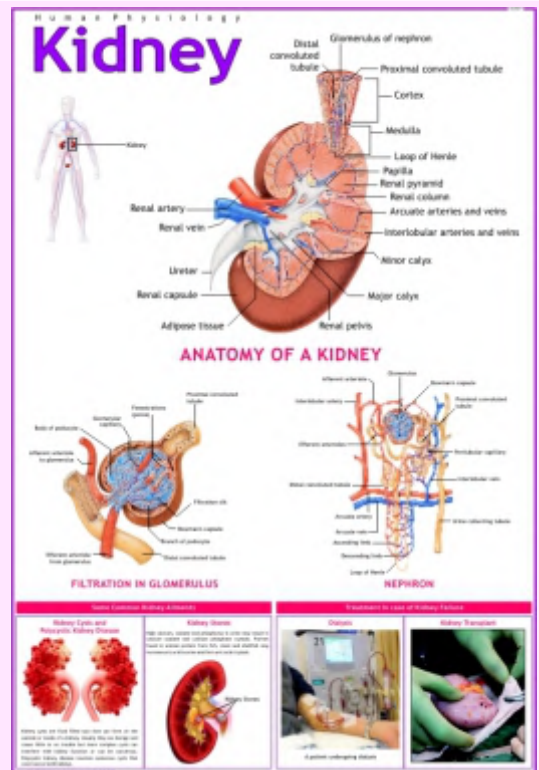
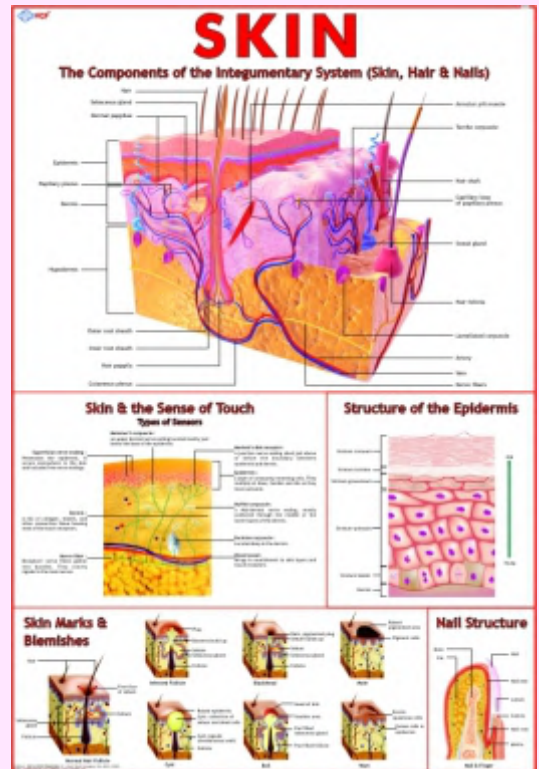
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- 23. Menstrual Cycle
- 24. Sense Organs & Reflex Action
- 25. Nephron
- 26. Mammary Glands
- 27. Skin (Integumentary System)
- 28. Kidney **NEW**
- 29. Larynx & Adam's Apple **NEW**
- 30. Joints in a Human Body **NEW**
- 31. Lungs & Trachea **NEW**
- 32. Spinal Cord & Vertebral Column **NEW**

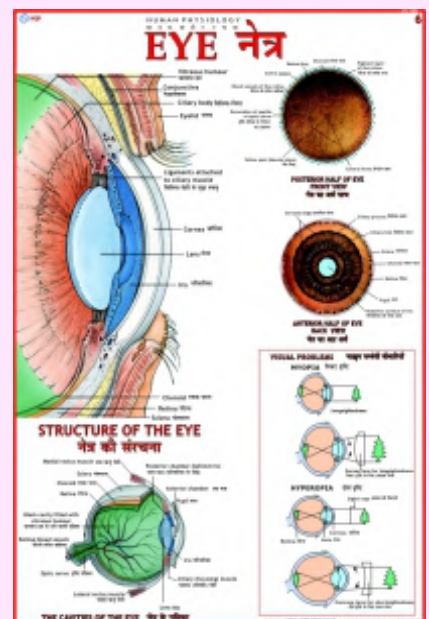
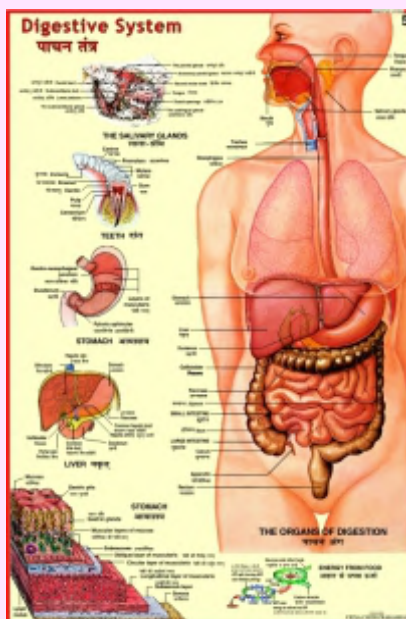
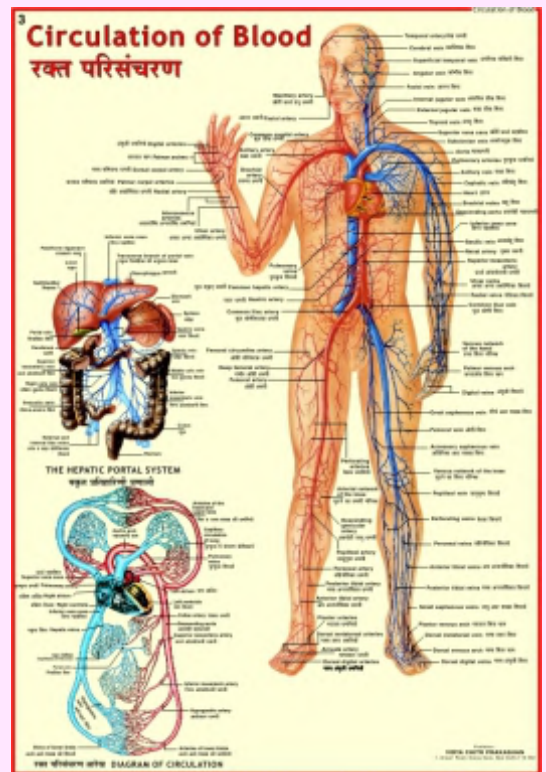
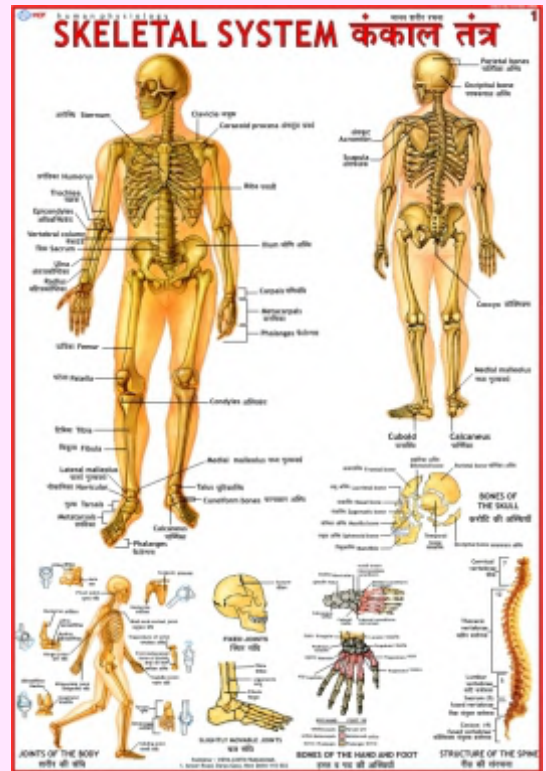


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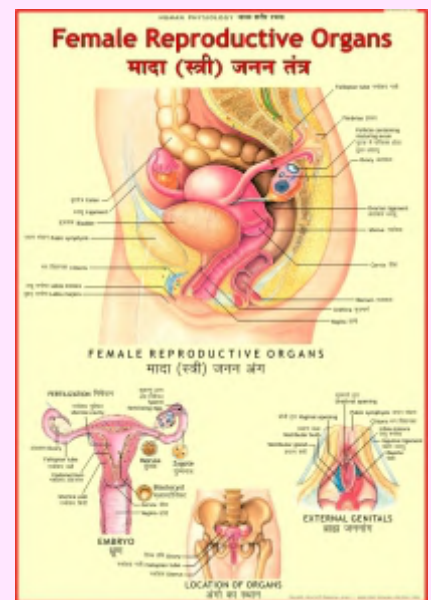
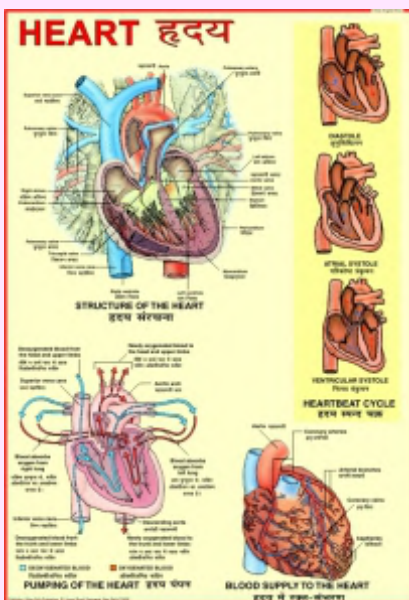
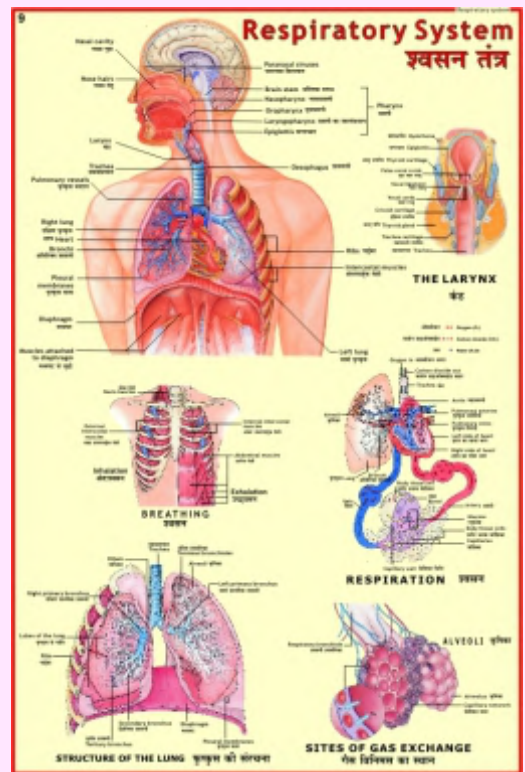
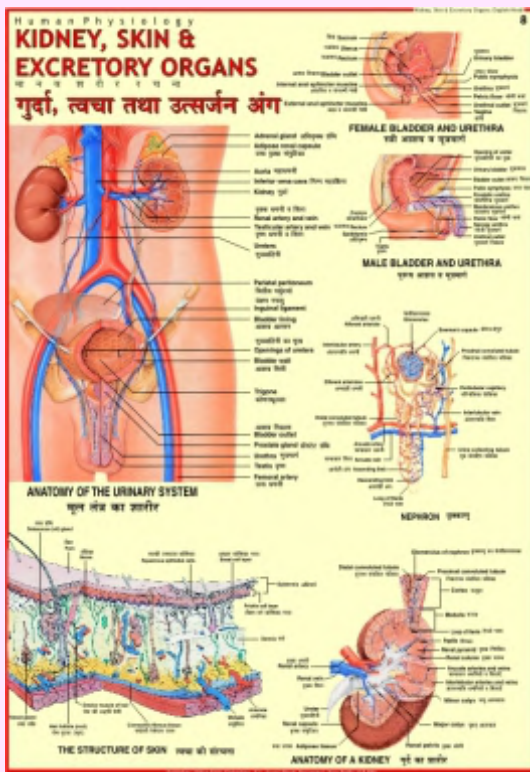
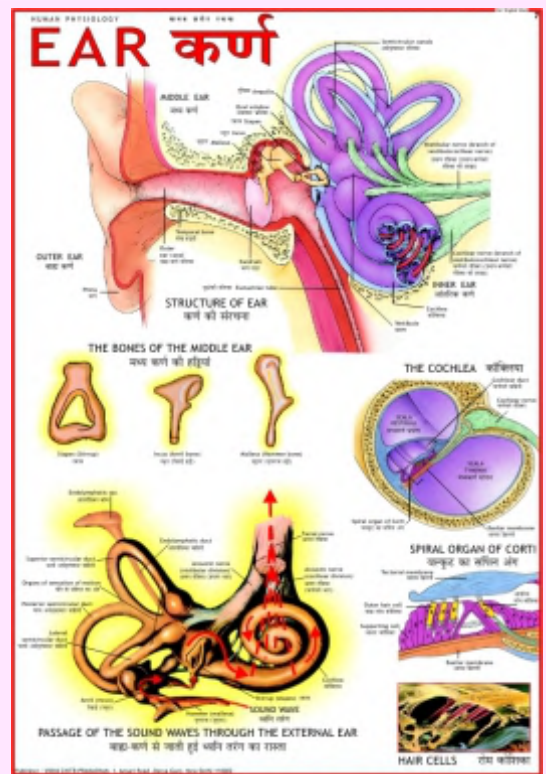
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10. Human Heart
11. Embryology
12. Male Reproductive Organs
13. Female Reproductive Organs



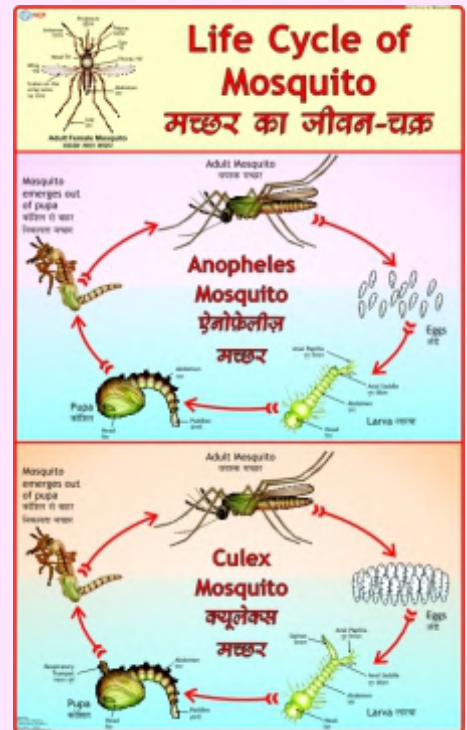
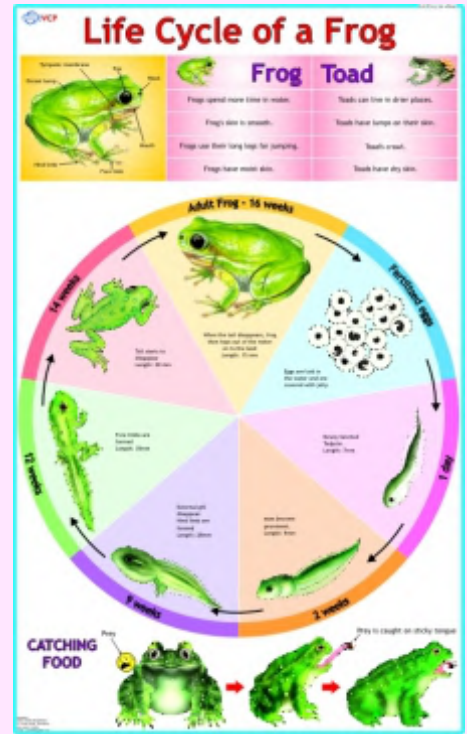
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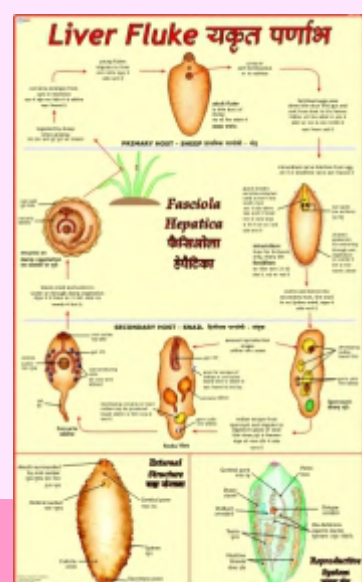
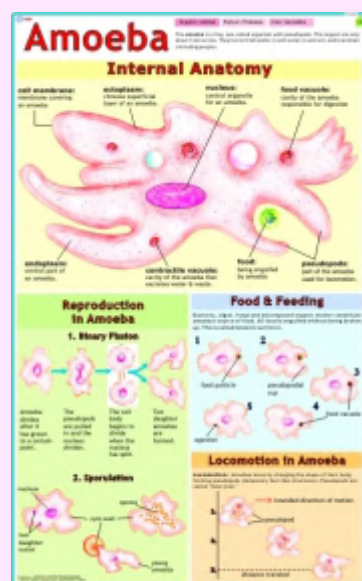
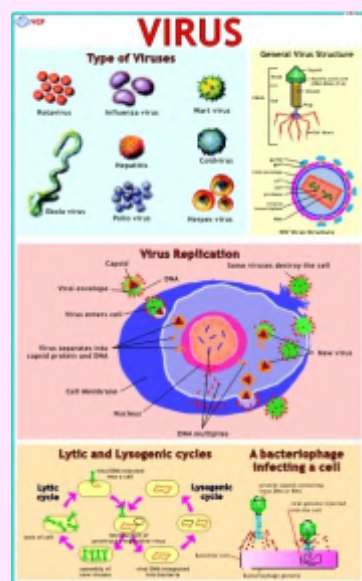
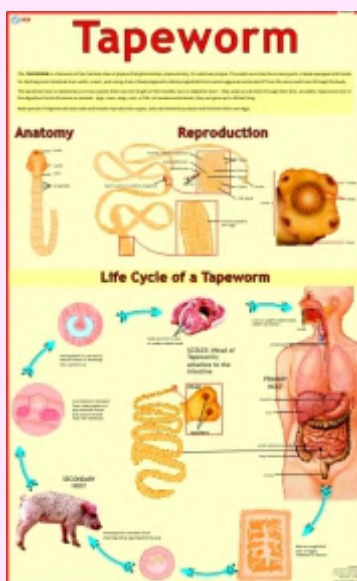
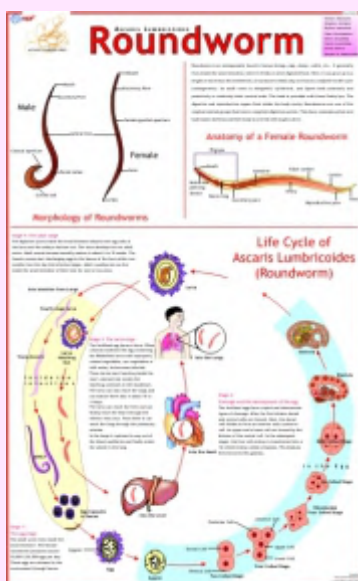
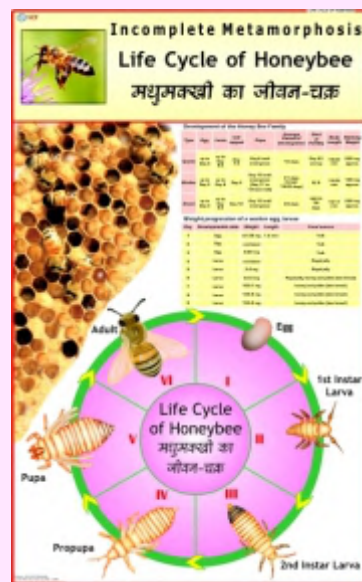
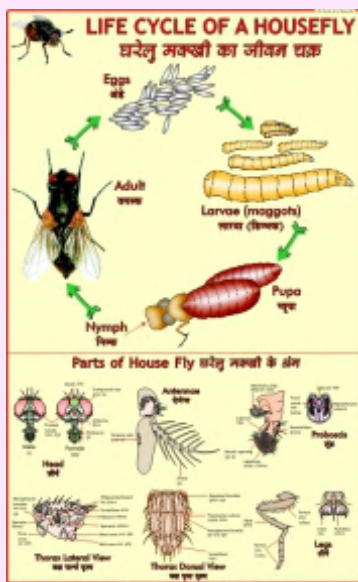


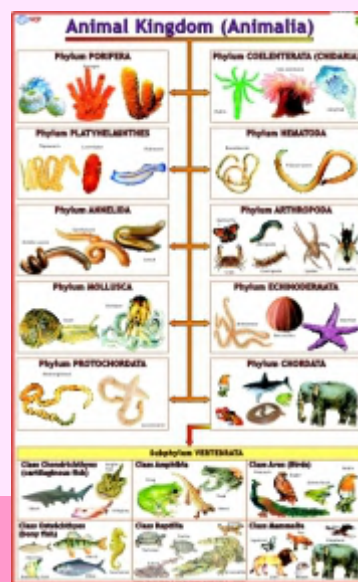
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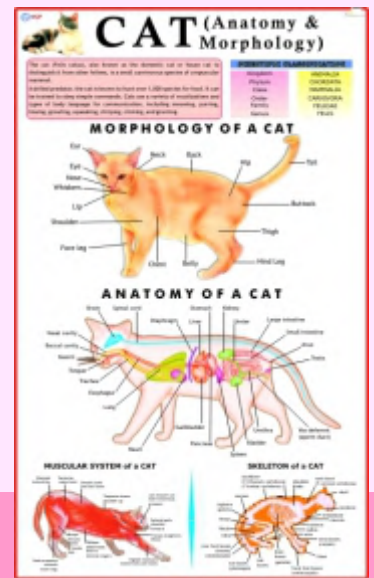
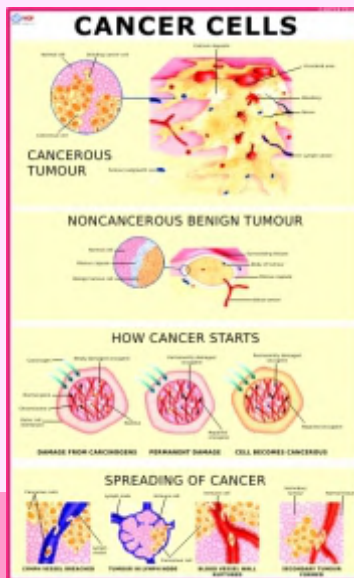
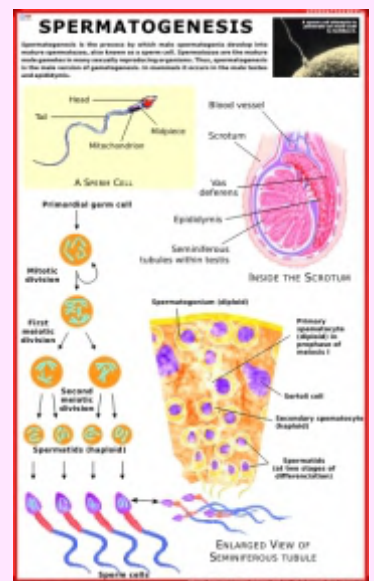
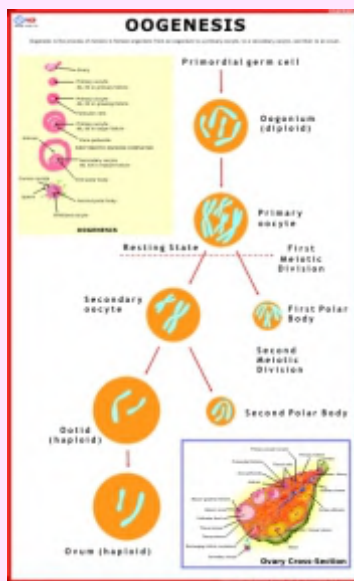
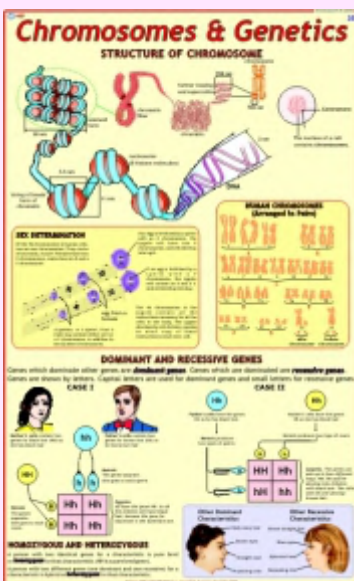
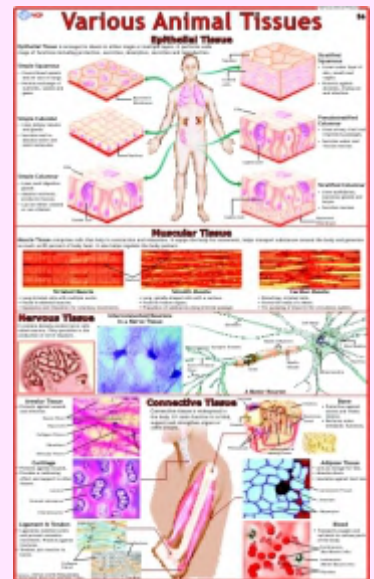
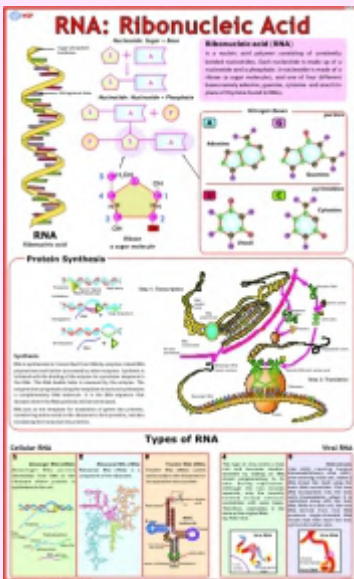
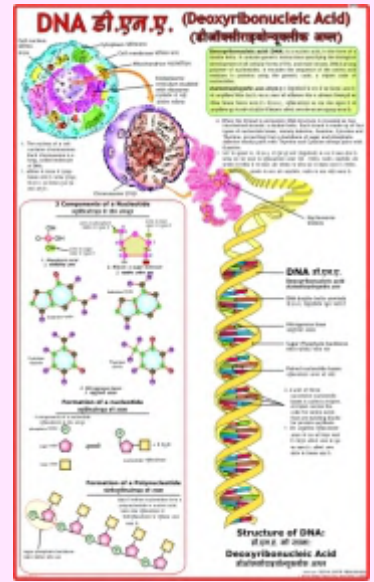
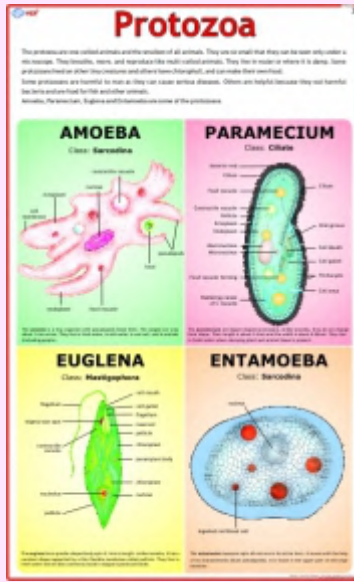
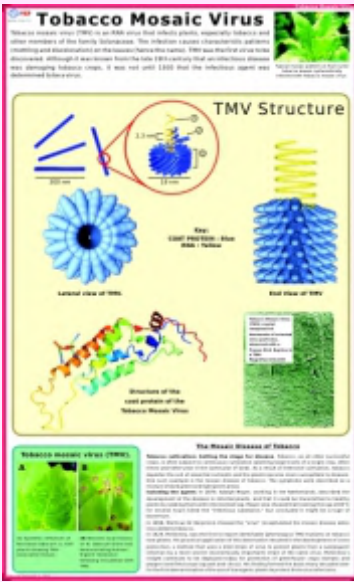
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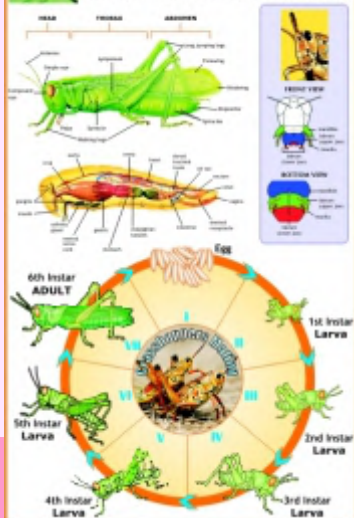
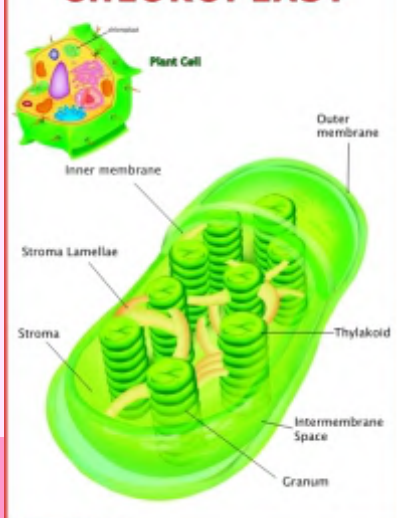
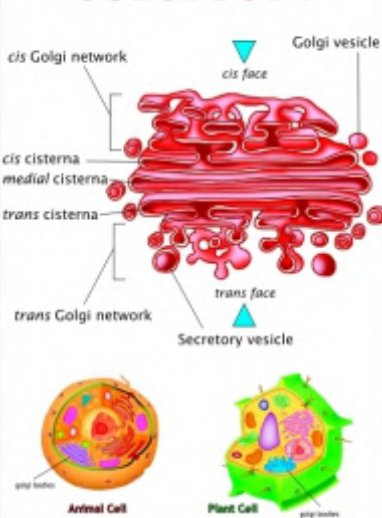
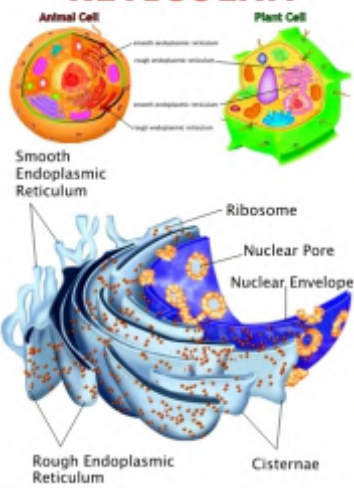
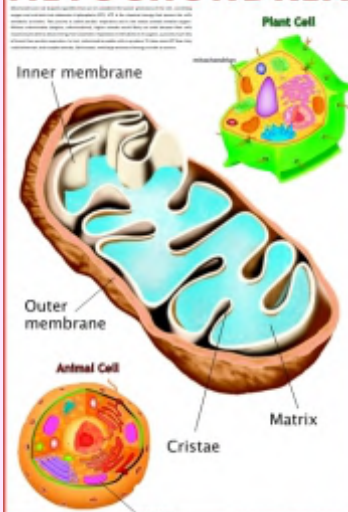
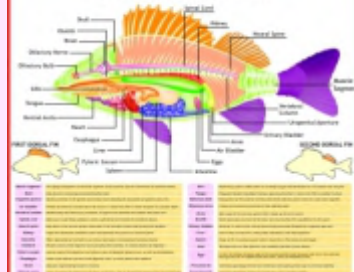
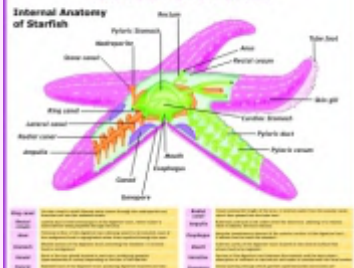
1. Life Cycle of Frog. (Kannada also)
- 1a. Tadpole
2. Life Cycle of Mosquito (Eng. & Hindi)
3. Life History of Butterfly.
4. Life Cycle of Housefly (Eng. & Hindi)
5. Life Cycle of Silk Worm
6. L. C. of Honey Bee (Incomplete Metamorphosis)
7. Roundworm (Ascaris Lumbricoides)
8. Tapeworm
9. Virus (Tamil also)
10. Krebs's Cycle
11. Malaria Parasite (Plasmodium)
12. Amoeba
13. Harmful Insects
14. Beneficial Insects
15. Vectors
16. Liver Fluke (Eng. & Hindi)
17. Meiosis in Animals
18. Mitosis in Animals
19. Rabbit Anatomy
20. Homologous & Analogous Organs
21. Ultra-structure of Plant Cell & Animal Cell
22. Hookworm (Eng. & Hindi)
23. Paramecium
24. Fish Anatomy (Eng. & Hindi)
25. Human Blood (Composition, Blood Groups, Blood Clotting)
26. Hydra (Eng. & Hindi)
27. Animal Cell (Eng. & Hindi also)
28. Animal Kingdom (Marathi (50x75 cm)
29. Tobacco Mosaic Virus
30. Protozoa (Eng. & Hindi)
31. D.N.A. (Eng. & Hindi)
32. R.N.A.
33. Food Chain (Eng. & Hindi also)
34. Various Animal Tissues (English only)
35. Chromosomes & Genetics
37. Oogenesis (available in Tamil also)
38. Amphioxus
39. Cancer Cells
40. Cat: Anatomy & Morphology
41. Snakes & Other Reptiles)
42. Reproduction in Animals
43. Starfish
44. Perch
45. The Five Kingdoms of Organisms
46. Cell Organelles
47. Mitochondria
48. Poultry
49. Endoplasmic Reticulum (Size 50x70cm) English











Size: 55 x 90 cm | English

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RAT ANATOMY (Eng. & Hindi)

51. Rat Digestive System
52. Rat External Character (Female Full)
53. Rat Arterial System
54. Rat Venous System
55. Rat Urogenital System (Male & Female)

COCKROACH ANATOMY

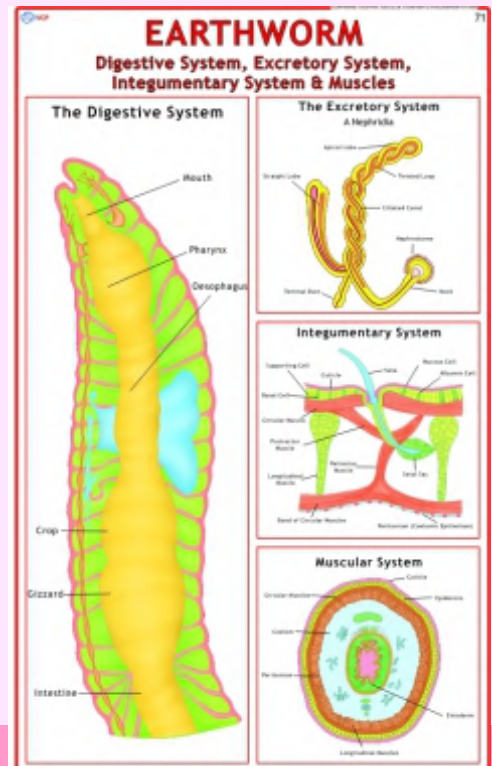
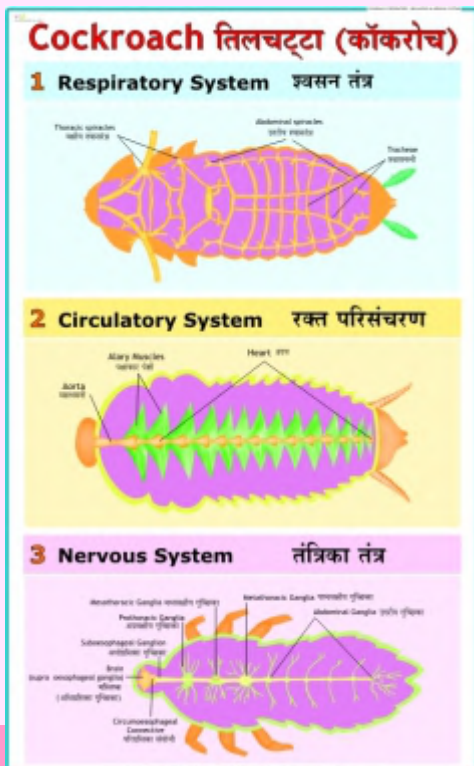
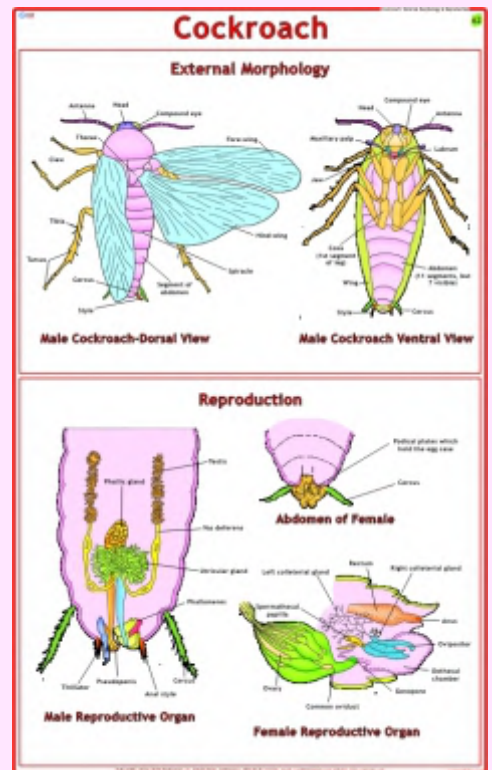
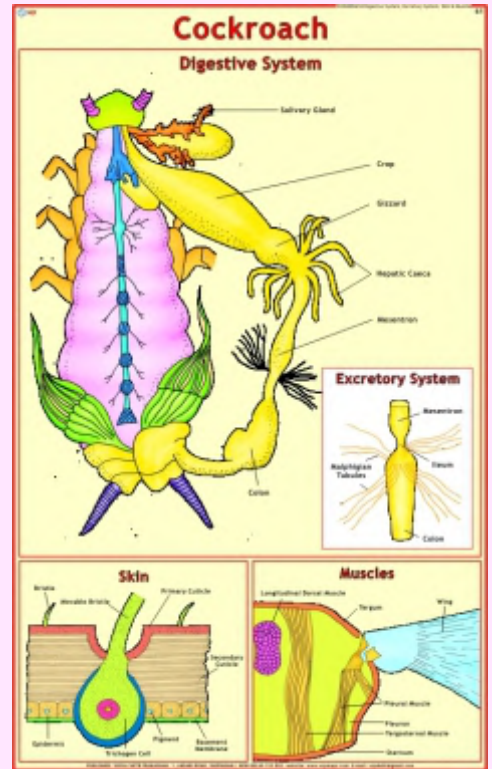
61. Cockroach: Digestion, Excretory, Skin & Muscles (English Only)
62. Cockroach: Morphology & Reproduction (English Only)
63. Cockroach: Blood Circulation, Respiratory & Nervous System

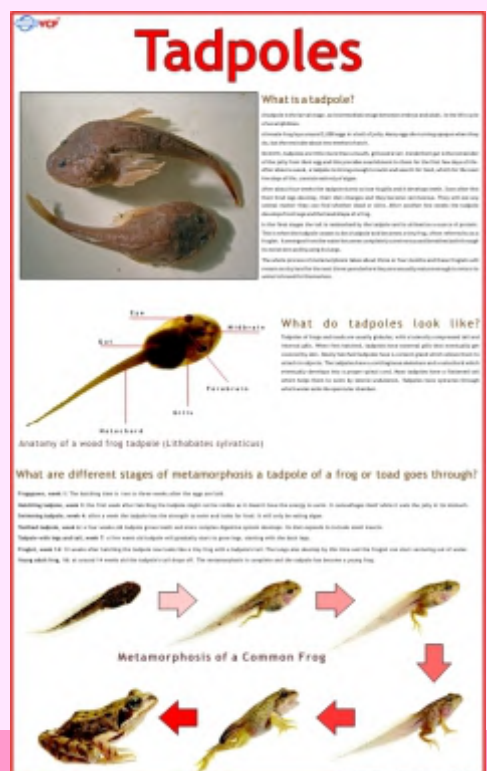
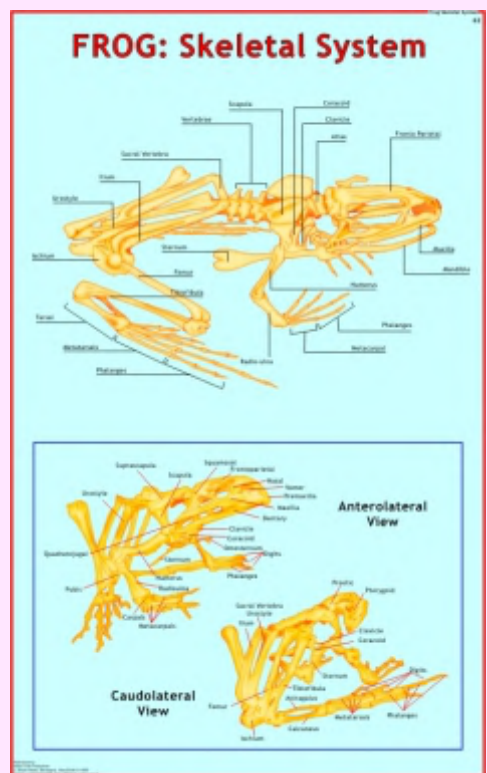
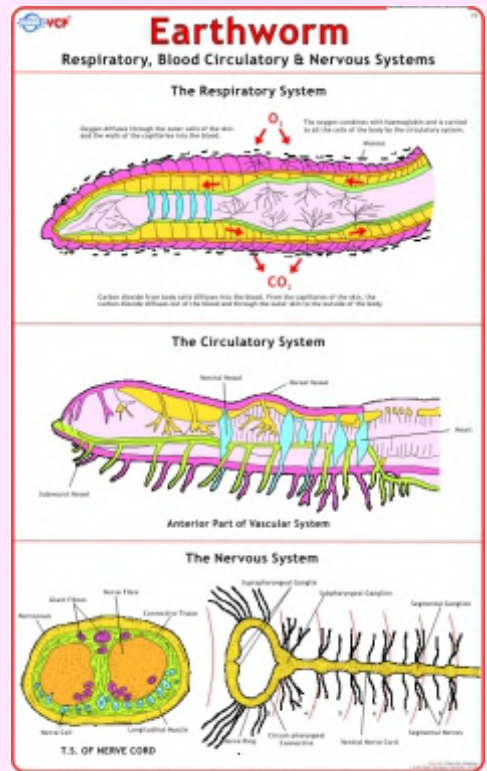
EARTHWORM ANATOMY

71. Earthworm: Digestion, Skin & Excretion
72. Earthworm: Ext. Morphology & Reproduction (English Only)
73. Earthworm: Blood Circulation, Respiratory, & Nervous System

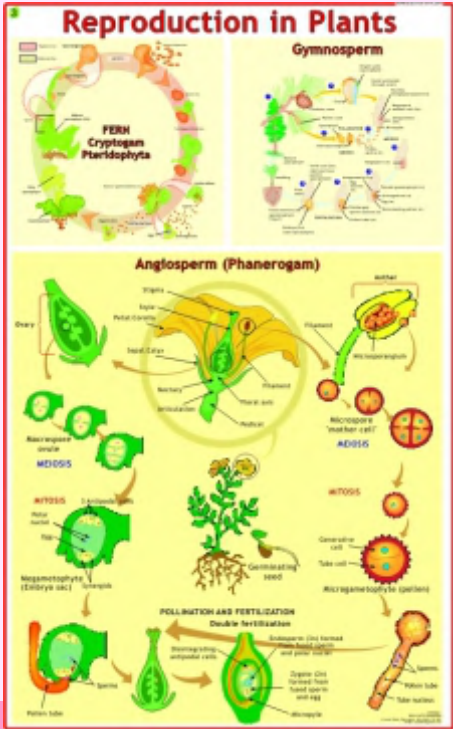
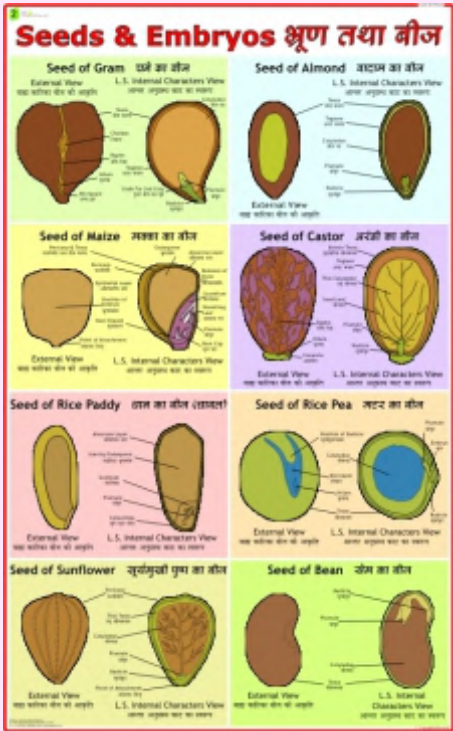
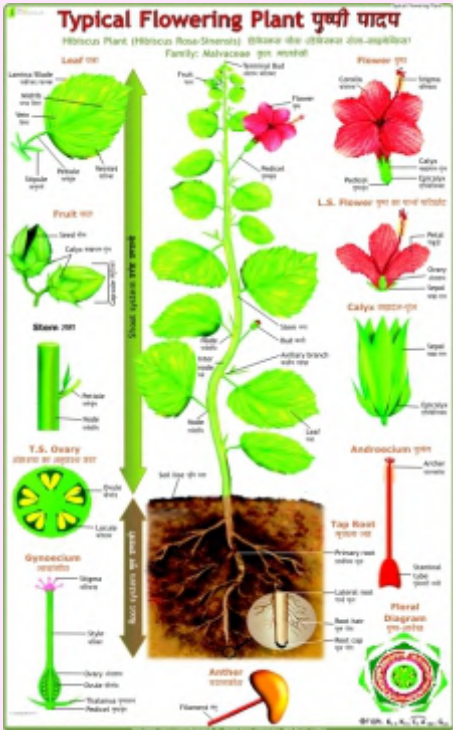
FROG ANATOMY

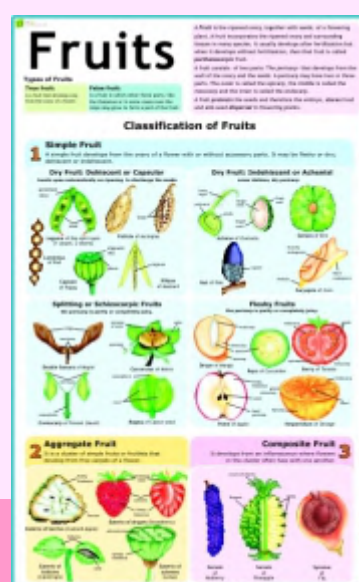
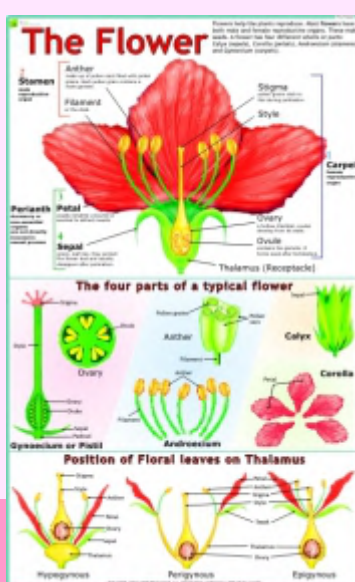
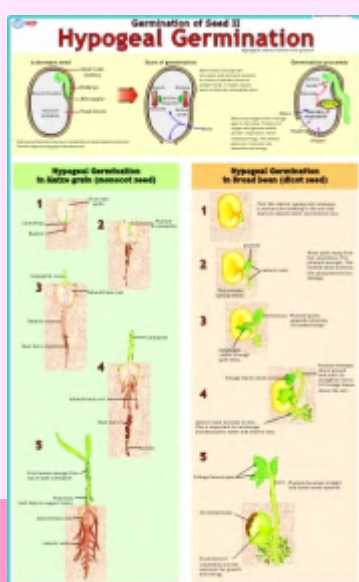
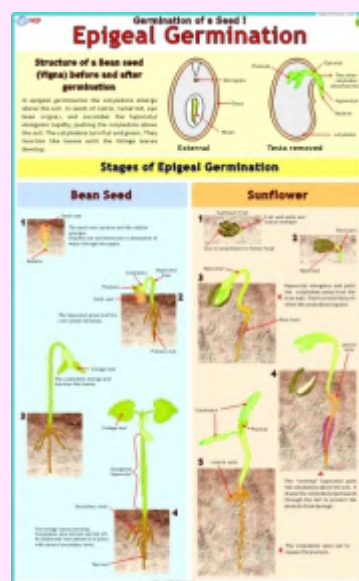
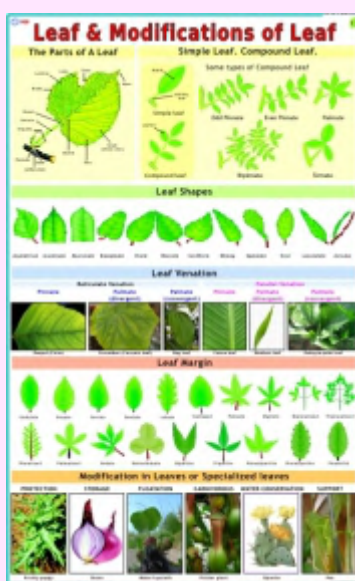
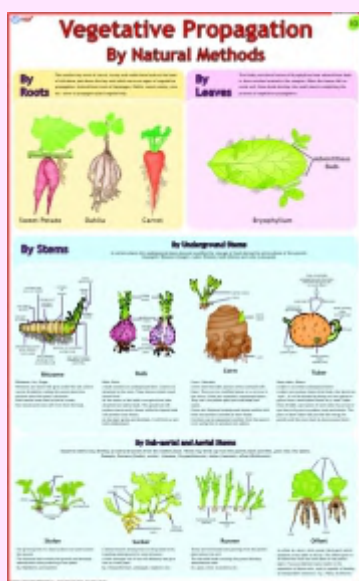
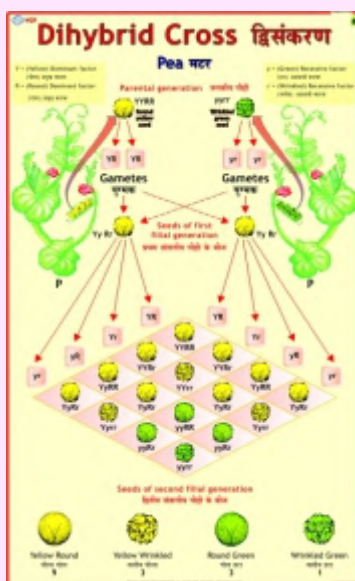
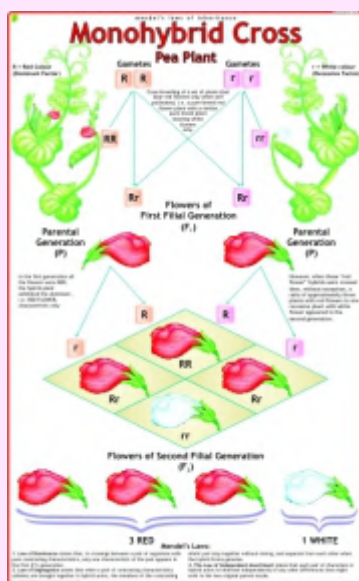
81. Life Cycle of a Frog
82. Excretory System
83. Dissection
84. Brain
85. Skull
86. Digestive System
87. Respiratory System
88. Skeleton
89. Cells & Tissues
90. Heart
91. Histology
92. Arterial System

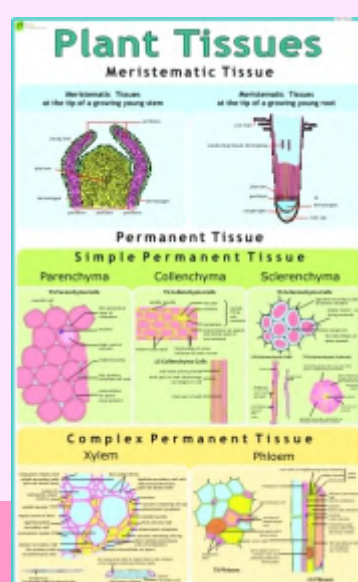
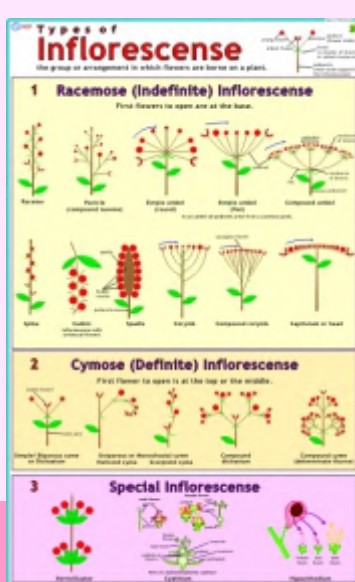
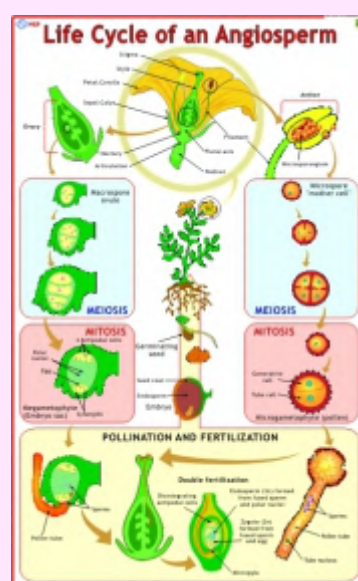
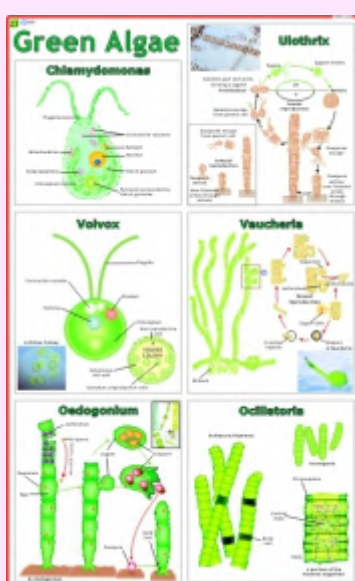
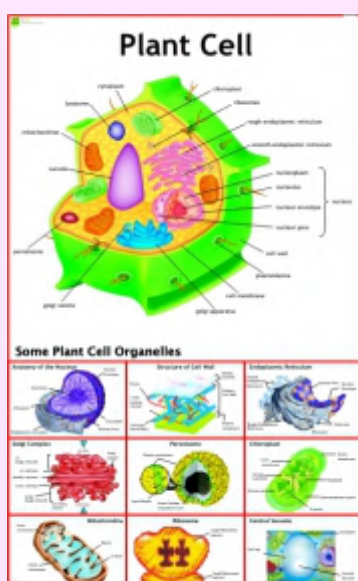
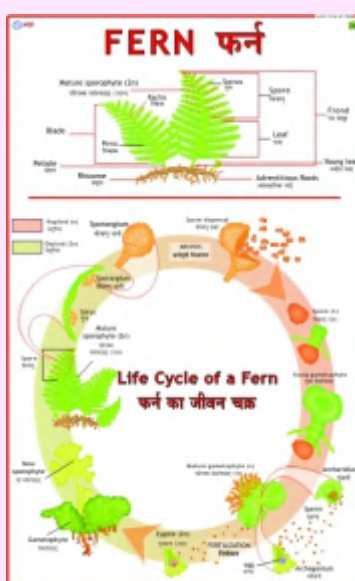
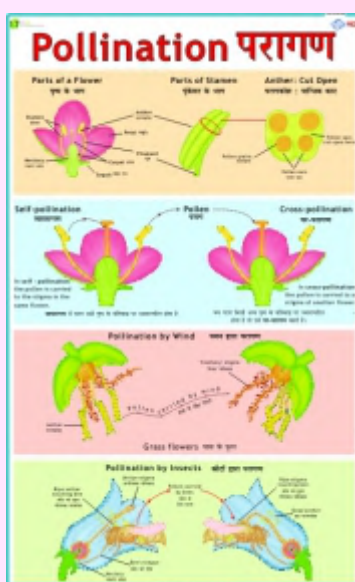


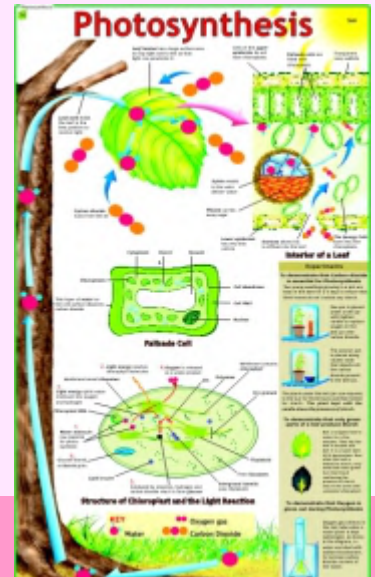
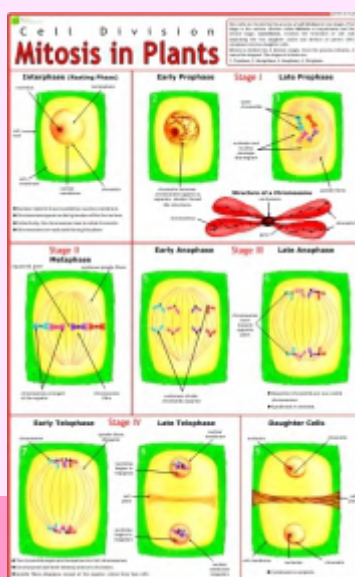
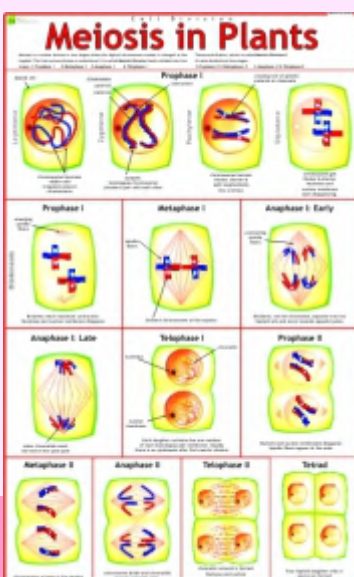
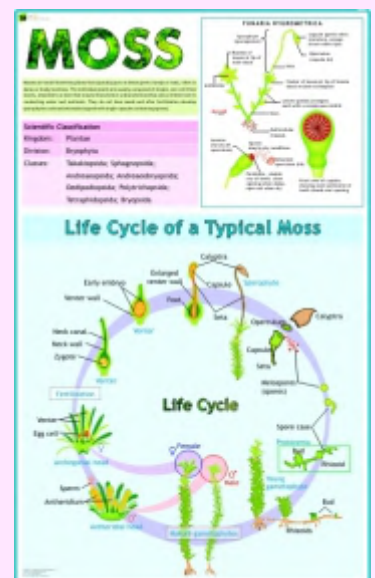
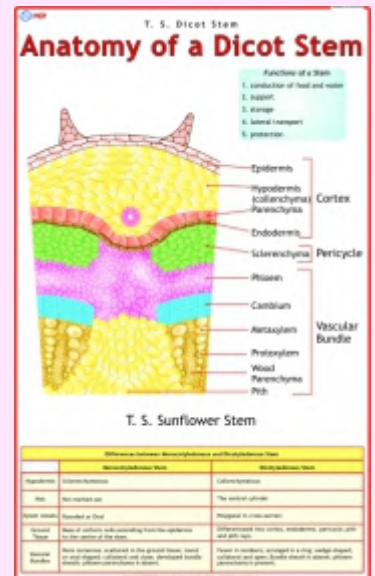
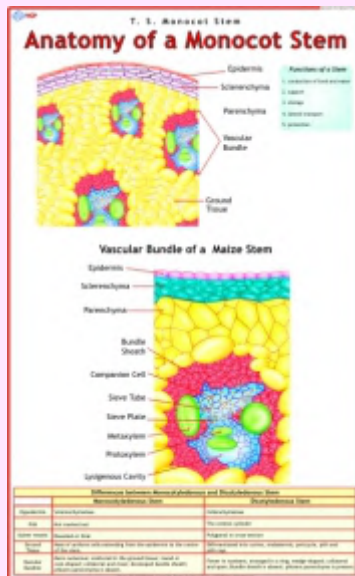
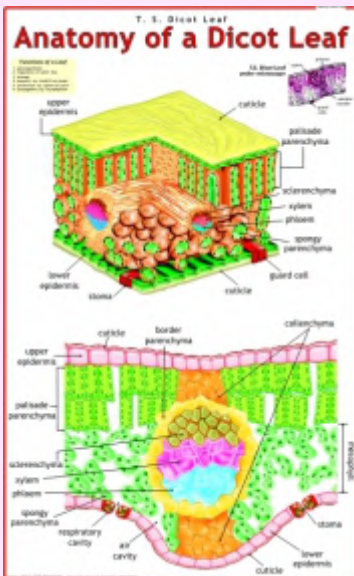
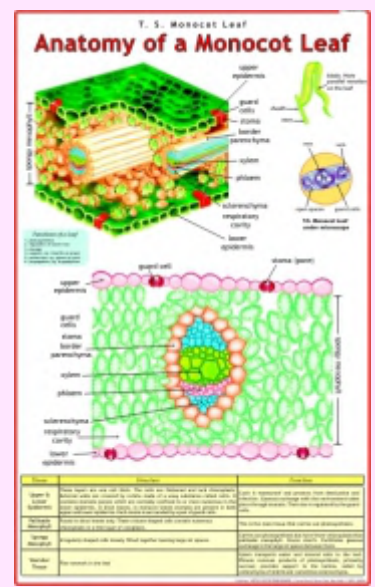
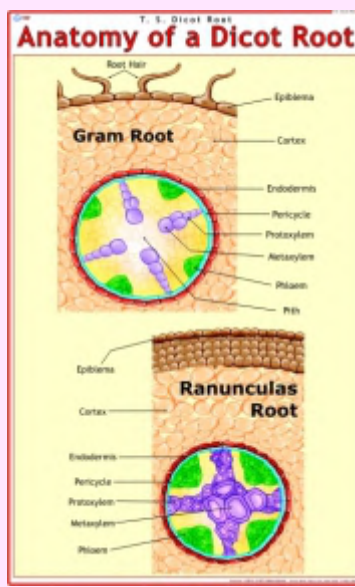
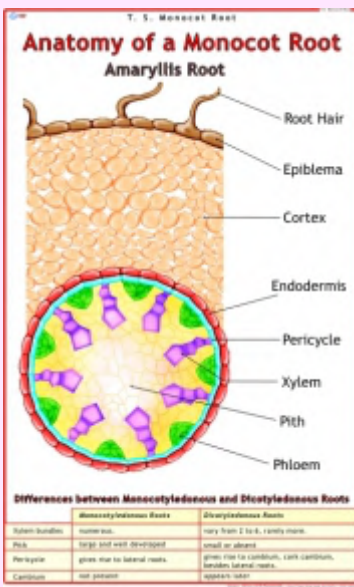


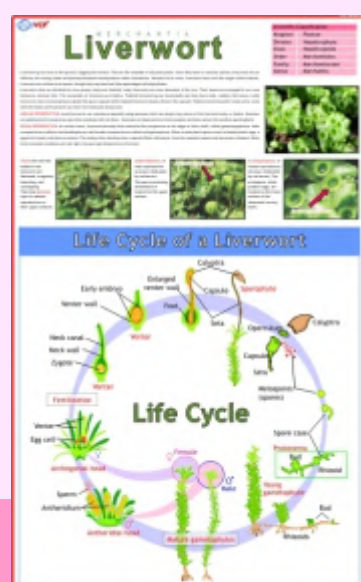
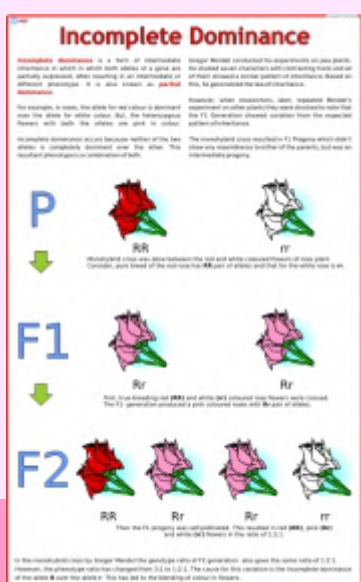
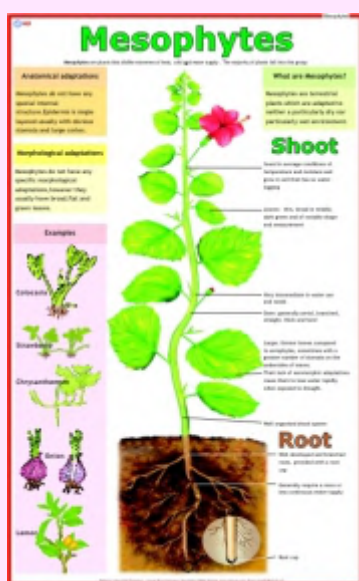
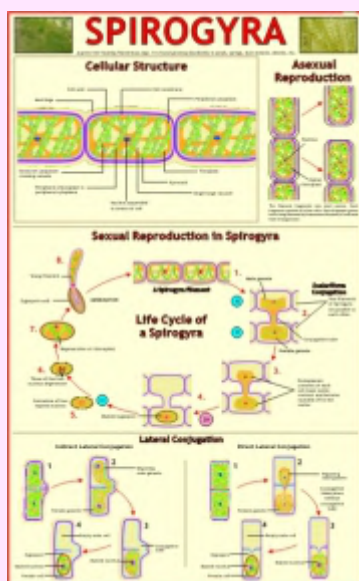
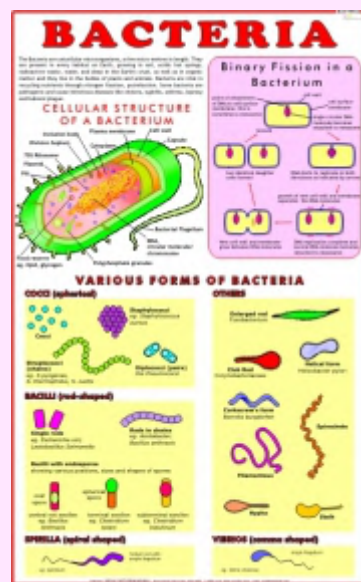
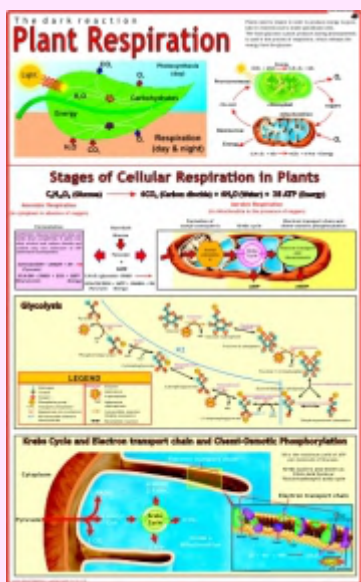
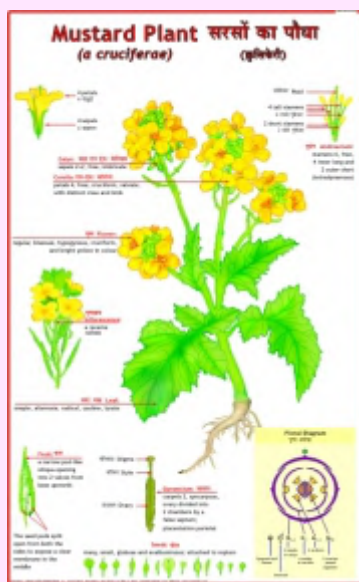
1. A Typical Flowering Plant (English & Hindi Also)
2. Seeds and Embryos (English & Hindi)
3. Reproduction in Plants
4. Adaptation in Plants (English only)
5. Dispersal of Fruits and Seeds
6. Kinds of Roots (Root Modification)(Eng. & Hindi)
7. Monohybrid Cross
8. Dihybrid Cross (English & Hindi)
9. Stem Modification
10. Vegetative Propagation
11. Leaf & Modifications of Leaf
12. Epigeal Germination (Bean Seed & Sunflower)
13. Hypogeal Germination (Maize & Broad Bean)
14. The Flower
15. Fruits
16. Kingdom of Fungi
17. Pollination (English & Hindi)
18. Fertilization
19. Medicinal Plants (English & Hindi)
20. Fern (English & Hindi)
21. Plant Diseases
22. Plant Cell (English & Hindi Also)
23. Green Algae
24. Life Cycle of an Angiosperm
25. Carnivorous Plants
26. Types of Inflorescence
27. Plant Tissues
28. Anatomy of Monocot Root
28a. Anatomy of Dicot Root
29. Anatomy of Monocot Leaf
29a. Anatomy of Dicot Leaf
30. Anatomy of Monocot Stem
30a. Anatomy of Dicot Stem
31. The Plant Kingdom (Classification of Plant)
32. Cell Organelles
33. Moss
34. Meiosis in Plants
35. Mitosis in Plants
36. Photosynthesis
37. Chlamydomonas
38. Mustard Plant (Cruciferae) (English & Hindi)
39. Mucor
40. Plant Respiration (Glycolysis, Krebs's Cycle..)
41. Bacteria
42. Spirogyra
43. Gymnosperms
44. Hydrophytes
45. Mesophytes
46. Xerophytes
47. Analogy in Plants
48. Homology in Plants
49. Golgi Apparatus/Golgi Bodies
50. Chloroplast (size 50x70 cm)
51. Incomplete Dominance
52. Liverwort (Marchantia)



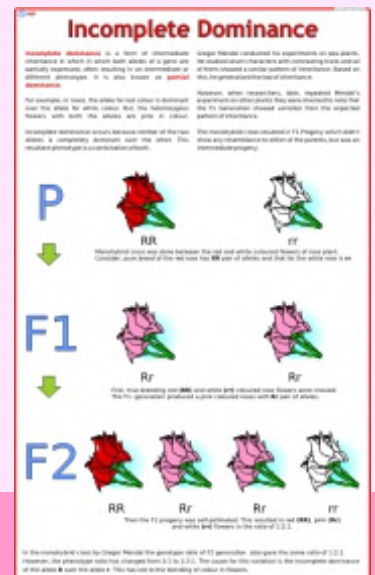








21



Size: 50 x 70 cm. Laminated | Hindi-English Combined | Each Rs. 160.00

1. Care of Mother during Pregnancy
2. Diet during Pregnancy
3. Preparing for the Delivery
4. Baby's Weight (Birth -10 years)
5. Correct & Regular Feeding
6. Baby's Diet
7. Baby's Development
8. Baby's Habits
9. Average Height & Weight : Chart of Children (5-18 years)

Care of Mother during Pregnancy
गर्भावस्था में जच्चा की देखभाल



Diet during Pregnancy
गर्भावस्था में आहार



Preparing for the Delivery
प्रसव की तैयारी



Baby's Weight
बच्चे का वजन



Age (yr)	Weight (kg.)	Height (inches)
Birth (at 1 year)	2.6	46.7
1 year/1 yr	3.8	58.4
2 year/2 yr	4.2	63.7
3 year/3 yr	4.9	67.8
4 year/4 yr	7.8	72.3
5 year/5 yr	9.6	80.1
6 year/6 yr	11.2	87.2
7 year/7 yr	12.9	94.3
8 year/8 yr	14.5	101.4
9 year/9 yr	16.3	107.4
10 year/10 yr	17.6	112.8
11 year/11 yr	19.4	118.3
12 year/12 yr	21.3	122.9
13 year/13 yr	23.6	128.4

Boy बालक

Age (yr)	Weight (kg.)	Height (inches)
Birth (at 1 year)	3.6	47.1
1 year/1 yr	5.3	59.1
2 year/2 yr	6.7	64.7
3 year/3 yr	7.4	68.2
4 year/4 yr	8.4	73.9
5 year/5 yr	10.1	81.6
6 year/6 yr	11.8	88.9
7 year/7 yr	13.5	96.9
8 year/8 yr	16.8	102.1
9 year/9 yr	18.3	108.3
10 year/10 yr	19.7	113.9
11 year/11 yr	21.3	119.3
12 year/12 yr	23.5	124.4

Correct & Regular Feeding
उचित व नियमित आहार



Baby's Diet
शिशु का भोजन



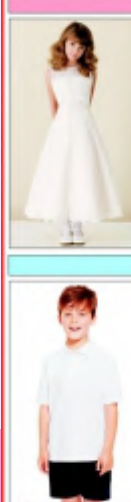
Baby's Development
बाल-विकास



Baby's Habits
बच्चों की आदतें



Average Height & Weight Chart of Children
बच्चों का औसत वजन व लम्बाई



Age (yr)	Weight (kg.)	Height (inches)
5 year/5 yr	17.7	108.4
6 year/6 yr	19.3	114.6
7 year/7 yr	21.8	120.6
8 year/8 yr	24.8	126.4
9 year/9 yr	28.5	132.3
10 year/10 yr	32.5	138.3
11 year/11 yr	37.7	142.6
12 year/12 yr	46.7	148.0
13 year/13 yr	49.8	153.0
14 year/14 yr	51.5	158.0
15 year/15 yr	53.8	162.0
16 year/16 yr	56.8	165.0
17 year/17 yr	58.4	166.0

Boy बालक

Age (yr)	Weight (kg.)	Height (inches)
5 year/5 yr	16.7	106.9
6 year/6 yr	20.7	116.1
7 year/7 yr	22.6	121.7
8 year/8 yr	26.3	127.6
9 year/9 yr	28.1	132.3
10 year/10 yr	31.4	137.5
11 year/11 yr	32.2	140.0
12 year/12 yr	37.0	147.0
13 year/13 yr	40.9	153.0
14 year/14 yr	47.0	160.0
15 year/15 yr	51.6	166.0
16 year/16 yr	58.0	171.0
17 year/17 yr	62.7	175.0
18 year/18 yr	65.0	177.0

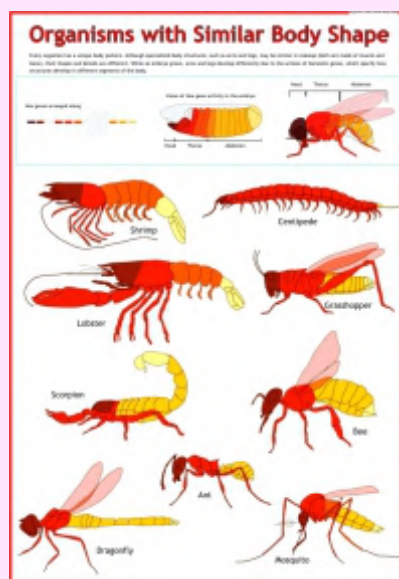
23

1. Unplanned Family
2. Small Family-Happy Family (Planned Family)
3. Temporary Methods of Family Planning
4. Space Your Child's Birth



Size: 50 x 70 cm. Laminated | English | Each Rs. 160.00

- [illegible]



Size: 55 x 90 cm | English

Laminated: Rs. 250.00 each

- Purification of Water
- Manufacture of Cement and Quick Lime (**H&E**)
- Preparation of Sulphur Dioxide & Sulphuric acid by Chamber and Contact Process
- Manufacture of Bleaching Powder and Soap
- Preparation of Chlorine and Manufacture of Hydrochloric Acid
- Nuclear Energy (Fission & Fusion Reactions; Nuclear Reactor)
- Preparation of Nitrogen and Manufacture of Nitric Acid.
- Preparation of Ammonia and Manufacture of Ammonia by Haber's Process
- Petroleum (Mining, Fractional Distillation and Cracking of Oil)
- Manufacture of Sodium Hydroxide & Sodium Carbonate (Ammonia Soda Process)
- Preparation of Oxygen
- Extraction of Iron (Blast Furnace) & Manufacture of Steel
- Separation of Substances (**Hindi & English**)
- Chemical Reactions (**Hindi & English**)
- Chemical Reactivity of Elements
- Composition of Water (**Hindi & English**)
- Aluminium Metallurgy (**Hindi & English**)
- Nuclear Reactor
- Preparation of Hydrogen & Carbon Dioxide (**H&E**)
- Sulphur & Phosphorus
- Uncontrolled Nuclear Reaction
- Valencies of Elements
- Mole Concept (Avogadro's Hypothesis)
- Structure of Atom
- Chemical Bonding
- Copper Metallurgy (**Hindi & English**)
- Organic Chemistry I
(Allotropy; Alkanes, Alkenes and Alkynes)
- Organic Chemistry II : Organic Compounds
(Alcohols, Esters and Organic Acids)
- Rutherford's Atomic Model; Anode Rays and Cathode rays
- Acids, Bases & Salts

Purification of Water

By Boiling	Clark's Process
$\text{Ca(HCO}_3)_2 \xrightarrow{\text{Boiling}} \text{CaCO}_3 \downarrow + \text{H}_2\text{O} + \text{CO}_2 \uparrow$ Caustic Carbonate	$\text{Ca(HCO}_3)_2 + \text{Ca(OH)}_2 \rightarrow 2\text{CaCO}_3 \downarrow + 2\text{H}_2\text{O}$ Caustic Carbonate
By Adding Washing Soda	The Calgon Process
$\text{CaSO}_4 + \text{Na}_2\text{CO}_3 \rightarrow \text{CaCO}_3 \downarrow + \text{Na}_2\text{SO}_4$ Washing Soda	$(\text{NaPO}_3)_n + 2\text{Na}^+ + \text{Na}_2\text{P}_2\text{O}_7^{4-}$
$\text{MgCl}_2 + \text{Na}_2\text{CO}_3 \rightarrow \text{MgCO}_3 \downarrow + 2\text{NaCl}$ Washing Soda	$\text{Ca}^{2+} + \text{Na}_2\text{P}_2\text{O}_7^{4-} \rightarrow 2\text{Na}^+ + \text{CaNa}_2\text{P}_2\text{O}_7^{2-}$

Permutit Process

$$\text{CaCl}_2 + 2\text{Na (Al-Silicate)} \rightarrow \text{Ca (Al-Silicate)} + 2\text{NaCl}$$

Hard water

$$\text{MgSO}_4 + 2\text{Na (Al-Silicate)} \rightarrow \text{Mg (Al-Silicate)} + \text{Na}_2\text{SO}_4$$

Hard water

Adding Brine

$$\text{Ca (Al-Silicate)} + 2\text{NaCl} \rightarrow 2\text{Na (Al-Silicate)} + \text{CaCl}_2$$

Brine

$$\text{Mg (Al-Silicate)} + 2\text{NaCl} \rightarrow 2\text{Na (Al-Silicate)} + \text{MgCl}_2$$

Brine

Manufacture of Cement & Quicklime

सीमेंट और चूना बनाने की विधि

Cement सीमेंट

Quicklime चूना

$$\text{CaCO}_3 \xrightarrow{1273^\circ\text{K}} \text{CaO} + \text{CO}_2$$

Limestone (Calcium Carbonate) $\rightarrow$ Lime (Calcium Oxide) $\rightarrow$ Carbon Dioxide

$$\text{CaO} + \text{H}_2\text{O} \rightarrow \text{Ca(OH)}_2 + \text{Heat}$$

Lime (Calcium Oxide) $\rightarrow$ Slaked Lime $\rightarrow$ 11000 Calories

Sulphuric Acid

Chamber Process

Contact Process

Preparation of Sulphur Dioxide (SO₂)

$$\text{S} + \text{O}_2 \rightarrow \text{SO}_2$$

Sulphur $\rightarrow$ Sulphur Dioxide

Bleaching Powder & Soap

Bleaching Powder (Calcium Hypochlorite/Calcium oxy-chloride)

$$2\text{Ca(OH)}_2 + 2\text{Cl}_2 \rightarrow \text{Ca(ClO)}_2 + \text{CaCl}_2 + 2\text{H}_2\text{O}$$

Manufacture of Bleaching Powder

Reaction: $\text{Ca(OH)}_2 + \text{Cl}_2 \rightarrow \text{Ca(OCl)}_2 + \text{CaCl}_2$

Soap

Soap is a salt of a long-chain fatty acid. It has a hydrophilic head and a hydrophobic tail.

Reaction: $\text{Fat} + \text{NaOH} \rightarrow \text{Soap} + \text{Glycerol}$

Preparation of Chlorine

The Properties of Chlorine

- It is a greenish-yellow gas with a pungent odor.
- It is heavier than air.
- It is soluble in water.
- It is a strong oxidizing agent.

$$2\text{HCl} + \text{MnO}_2 + \text{H}_2\text{SO}_4 \xrightarrow{\text{Heat}} 2\text{H}_2\text{SO}_4 + \text{MnSO}_4 + 2\text{H}_2\text{O} + \text{Cl}_2$$

Preparation of Hydrochloric Acid

$$\text{NaCl} + \text{H}_2\text{SO}_4 \rightarrow \text{NaHSO}_4 + \text{HCl}$$

$$\text{NaCl} + \text{NaHSO}_4 \xrightarrow{\text{Heat}} \text{Na}_2\text{SO}_4 + \text{HCl}$$

Nuclear Energy

Nuclear energy is the energy released during the splitting or fusion of atomic nuclei.

Nuclear Fission

A Chain Reaction

A Moderated Chain Reaction

$$\text{U}^{235} + \text{n} \rightarrow \text{Fission} + 2 \text{ or } 3 \text{ n} + 200 \text{ MeV}$$

Nuclear Fusion

Fusion reaction

Fusion reaction in the sun

The CNO Cycle: Fusion reaction in stars heavier than sun

Nuclear Power Plant

Preparation of Nitrogen

Preparation of nitrogen from the atmosphere

Preparation of nitrogen by the action of heat on ammonium nitrate

$$2\text{NH}_4\text{NO}_3 \xrightarrow{\text{Heat}} 2\text{N}_2 + 4\text{H}_2\text{O}$$

Laboratory preparation of Nitric Acid

Reaction: $\text{KNO}_3 + \text{H}_2\text{SO}_4 \rightarrow \text{KHSO}_4 + \text{HNO}_3$

Industrial manufacture of Nitric Acid

THE OSTWALD PROCESS

Preparation of Ammonia

Haber Process

$$\text{N}_2(\text{g}) + 3\text{H}_2(\text{g}) \rightleftharpoons 2\text{NH}_3(\text{g})$$

Laboratory Preparation of Ammonia

Reaction: $\text{Ca(OH)}_2 + 2\text{NH}_4\text{Cl} \rightarrow \text{CaCl}_2 + 2\text{H}_2\text{O} + 2\text{NH}_3$

Petroleum

Crude Oil Deposits

Anticline

Fault

Mining (Oil Drilling Rig)

Refining by Fractional Distillation

Fraction	Boiling Point	Uses
Gasoline	30-100°C	Motor fuel
Kerosene	150-300°C	Jet fuel, heating oil
Diesel	250-350°C	Truck and bus fuel
Heavy oil	350-400°C	Industrial fuel
Residue	> 400°C	Asphalt, bitumen

Sodium Carbonate (Washing Soda) by Solvay's Process

Sodium Hydroxide (Caustic Soda)

Electrolysis Cell

Castner-Kellner Cell

Preparation of Oxygen

Laboratory Preparation of Oxygen

Reaction: $2\text{KClO}_3 \xrightarrow{\text{Heat}} 2\text{KCl} + 3\text{O}_2$

Manufacture of Oxygen

Claus Process

POSITION IN PERIODIC TABLE

Group	Period	Element
1	1	H
2	1	He
3	1	Li
4	1	Be
5	1	B
6	1	C
7	1	N
8	1	O
9	1	F
10	1	Ne
11	2	Na
12	2	Mg
13	2	Al
14	2	Si
15	2	P
16	2	S
17	2	Cl
18	2	Ar
19	3	K
20	3	Ca
21	3	Sc
22	3	Ti
23	3	V
24	3	Cr
25	3	Mn
26	3	Fe
27	3	Co
28	3	Ni
29	3	Cu
30	3	Zn
31	3	Ga
32	3	Ge
33	3	As
34	3	Se
35	3	Br
36	3	Kr
37	4	Rb
38	4	Sr
39	4	Y
40	4	Zr
41	4	Nb
42	4	Mo
43	4	Tc
44	4	Ru
45	4	Rh
46	4	Pd
47	4	Ag
48	4	Cd
49	4	In
50	4	Sn
51	4	Pb
52	4	Bi
53	4	Po
54	4	At
55	5	Cs
56	5	Ba
57	5	La
58	5	Ce
59	5	Pr
60	5	Nd
61	5	Pm
62	5	Sm
63	5	Eu
64	5	Gd
65	5	Tb
66	5	Dy
67	5	Ho
68	5	Er
69	5	Tm
70	5	Yb
71	5	Lu
72	6	Hf
73	6	Ta
74	6	W
75	6	Re
76	6	Os
77	6	Ir
78	6	Pt
79	6	Au
80	6	Hg
81	6	Tl
82	6	Pb
83	6	Bi
84	6	Po
85	6	At
86	6	Rn
87	7	Fr
88	7	Ra
89	7	Ac
90	7	Th
91	7	Pa
92	7	U
93	7	Np
94	7	Pu
95	7	Am
96	7	Cm
97	7	Bk
98	7	Cf
99	7	Es
100	7	Fm
101	7	Md
102	7	No
103	7	Lr

USES OF OXYGEN

- Supports combustion.
- Used in welding.
- Used in the manufacture of steel.
- Used in the treatment of wastewater.

TEST FOR OXYGEN

Reigning substance (e.g., MnO2, K2Cr2O7, PbO2, etc.)

Extraction of Iron

Steps in Extraction of Iron

- Concentration of ore
- Calcination of ore
- Reduction of iron oxide

Manufacture of Steel

Basic oxygen process

Separation of Substances

Separation of substances is the process of isolating a pure substance from a mixture.

Methods of Separation

- Sedimentation and Decantation**
- Filtration**
- Crystallization**
- Distillation**
- Extraction**
- Sublimation**
- Chromatography**
- Electrolysis**

Chemical Reactions

रासायनिक अभिक्रियाएँ

Characteristics of Chemical Reactions

- Change in color
- Change in temperature
- Change in state
- Change in odor
- Change in mass

Types of Chemical Reactions

- Combination**
- Decomposition**
- Displacement**
- Double Displacement**
- Redox**

Chemical Reactivity of Elements

Element	Group	Period	Atomic Number	Symbol
Hydrogen	1	1	1	H
Helium	18	1	2	He
Lithium	1	2	3	Li
Beryllium	2	2	4	Be
Boron	13	2	5	B
Carbon	14	2	6	C
Nitrogen	15	2	7	N
Oxygen	16	2	8	O
Fluorine	17	2	9	F
Neon	18	2	10	Ne
Sodium	1	3	11	Na
Magnesium	2	3	12	Mg
Aluminum	13	3	13	Al
Silicon	14	3	14	Si
Phosphorus	15	3	15	P
Sulfur	16	3	16	S
Chlorine	17	3	17	Cl
Argon	18	3	18	Ar
Potassium	1	4	19	K
Calcium	2	4	20	Ca
Scandium	3	4	21	Sc
Titanium	4	4	22	Ti
Vanadium	5	4	23	V
Chromium	6	4	24	Cr
Manganese	7	4	25	Mn
Iron	8	4	26	Fe
Cobalt	9	4	27	Co
Nickel	10	4	28	Ni
Copper	11	4	29	Cu
Zinc	12	4	30	Zn
Gallium	13	4	31	Ga
Germanium	14	4	32	Ge
Arsenic	15	4	33	As
Selenium	16	4	34	Se
Bromine	17	4	35	Br
Krypton	18	4	36	Kr
Rubidium	1	5	37	Rb
Strontium	2	5	38	Sr
Yttrium	3	5	39	Y
Zirconium	4	5	40	Zr
Niobium	5	5	41	Nb
Molybdenum	6	5	42	Mo
Technetium	7	5	43	Tc
Ruthenium	8	5	44	Ru
Rhodium	9	5	45	Rh
Palladium	10	5	46	Pd
Silver	11	5	47	Ag
Cadmium	12	5	48	Cd
Indium	13	5	49	In
Sn	14	5	50	Sn
Pb	16	5	82	Pb
Bi	15	5	83	Bi
Po	14	5	84	Po
At	17	5	85	At
Rn	18	5	86	Rn
Fr	1	6	87	Fr
Ra	2	6	88	Ra
Ac	3	6	89	Ac
Th	4	6	90	Th
Pa	5	6	91	Pa
U	6	6	92	U
Np	7	6	93	Np
Pu	8	6	94	Pu
Am	9	6	95	Am
Cm	10	6	96	Cm
Bk	11	6	97	Bk
Cf	12	6	98	Cf
Es	13	6	99	Es
Fm	14	6	100	Fm
Md	15	6	101	Md
No	16	6	102	No
Lr	17	6	103	Lr

Organic Chemistry II

Organic Compounds

Alcohol

Alcohol	Molecular formula C _n H _{2n+2} O	No. of carbon atoms	Boiling point (°C)
Methanol	CH ₃ OH	1	65
Ethanol	C ₂ H ₅ OH	2	78
Propan-1-ol	C ₃ H ₇ OH	3	97
Butan-1-ol	C ₄ H ₉ OH	4	117
Pentan-1-ol	C ₅ H ₁₁ OH	5	137

CH₃OH

CH₃-OH

H-C-O-H

C₂H₅OH

C₂H₅-OH

H-C-C-O-H

C₃H₇OH

C₃H₇-OH

H-C-C-C-O-H

Organic acids (Carboxylic acids)

All these acids have the functional group -COOH attached to a hydrocarbon chain.

Carboxylic acid	Molecular formula C _n H _{2n} COOH	Melting Point (°C)	Boiling point (°C)
Methanoic acid	HCOOH	9	100
Ethanoic acid	CH ₃ COOH	17	118

HCOOH

Methanoic acid

H-C(=O)-OH

CH₃COOH

Ethanoic acid

H-C(=O)-OH

Esters

Ethanoic acid will react with ethanol, in the presence of a few drops of concentrated sulphuric acid, to produce ethyl ethanoate.

Many of these compounds occur naturally. They are responsible for the flavours in fruit, and for the scents of flowers. We use them as food flavourings and in perfumes. Fats and oils are naturally occurring, which used for energy storage in plants and animals.

CH₃COOH + C₂H₅OH

→

CH₃COOC₂H₅ + H₂O

HCOOH + C₂H₅OH

→

HCOOC₂H₅ + H₂O

CH₃COOH + C₂H₅OH

→

CH₃COOC₂H₅ + H₂O

Rutherford's Atomic Model, Anode Rays & Cathode Rays

1. Cathode Rays (Cathode ray experiment)

2. Anode Rays (Anode ray experiment)

3. Rutherford's Atomic Model

4. Cathode Rays

5. Anode Rays

Acids, Bases & Salts

Acids

Bases

Salts

Testing Acids and Alkalies: the pH Scale

pH	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Indicator	Red	Orange-red	Orange	Yellow-orange	Yellow	Green-yellow	Green	Blue-green	Blue	Dark blue	Dark blue	Dark blue	Dark blue	Dark blue

LARGE Chemistry Charts

Size: 70 x 100 cm.

English

Laminated Rs. 250/- Each

1. Preparation of Sulphur Dioxide & Sulphuric acid by Chamber and Contact Process
2. Preparation of Nitrogen and Manufacture of Nitric Acid from Nitre
3. Preparation of Ammonia and Manufacture of Ammonia by Haber's Process
4. Extraction of Iron (Blast Furnace) & Manufacture of Steel
5. Aluminium Metallurgy
6. Extraction of Sodium Metal
7. Sulphur & Phosphorus
8. Mfg. of Sodium Hydrogen Carbonate

Extraction of Aluminium

Manufacture of Nitric Acid

Laboratory preparation of Nitric Acid

Extraction of Sodium Metal

Down's Process

Refining of Aluminium

Preparation of Nitrogen

LABORATORY CHARTS

LABORATORY SAFETY

LABORATORY DRESS

HOUSEKEEPING

CHEMICAL SPILLS

TRANSFERRING LIQUIDS

LABELLING CHEMICALS

HEATING CHEMICALS

EYE WASH

WATER REACTIVE MATERIALS

FIRE EXTINGUISHERS

HAZARDOUS WASTE

WASTE CONTAINERS

SAFETY RULES

Size 55x90 cm

Laminated: Each Rs. 250.00

LABORATORY TECHNIQUES

DISTILLATION

HEATING A LIQUID

FILTERING & DECONTAMINATION

USING TONGS

TRANSFERRING LIQUIDS

HEATING A CRUCIBLE

PIPETTING

CLEANING GLASSWARE

DRYING GLASSWARE

LABORATORY EQUIPMENTS

Size 55x90 cm

Laminated: Each Rs. 250.00

pH chart

Testing Acids and Alkalies

Acids

Alkalies

Indicator

Acids

Alkalies

Examples of indicators at this pH

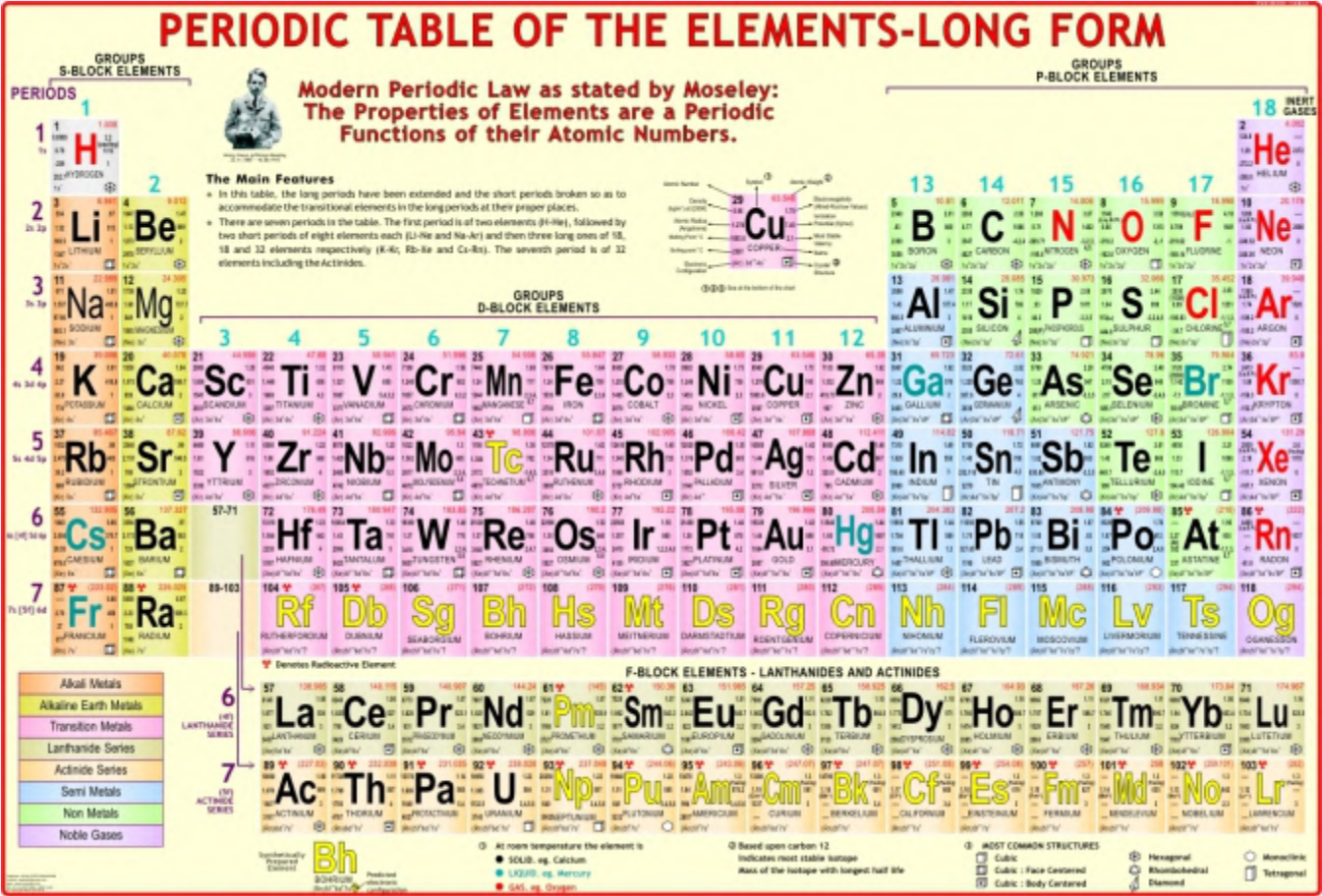
pH	Indicator	Examples of indicators at this pH
0	Acidic	Acidic
1	Acidic	Acidic
2	Acidic	Acidic
3	Acidic	Acidic
4	Acidic	Acidic
5	Acidic	Acidic
6	Acidic	Acidic
7	Neutral	Neutral
8	Alkaline	Alkaline
9	Alkaline	Alkaline
10	Alkaline	Alkaline
11	Alkaline	Alkaline
12	Alkaline	Alkaline
13	Alkaline	Alkaline
14	Alkaline	Alkaline

Size 70x100 cm

Laminated: Each Rs. 250.00

Long Form Periodic Table Chart

(showing 118 Elements)



Size: 140 x 100 cm

DESKTOP Size: 45 x 28 cm

Laminated Each Rs. 500.00

HARD 80 micron Lamination Each Rs. 100.00

Size: 100 x 70 cm

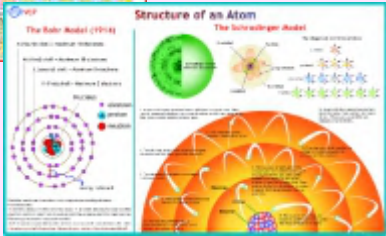
Laminated Each Rs. 250.00

Polyart (Plastic Sheet) Rs. 300.00



Moseley's
Periodic table
on the FRONT

Structure of Atom
explained
on the BACK



Size: 50 x 36 cm

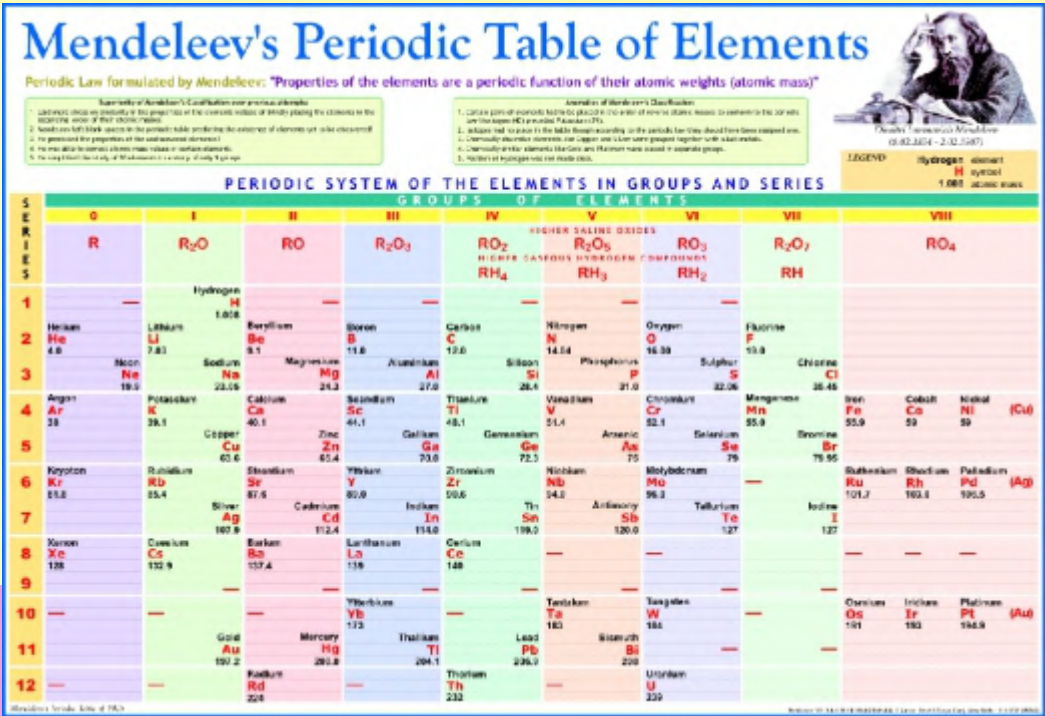
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Mendeleev's Periodic Table

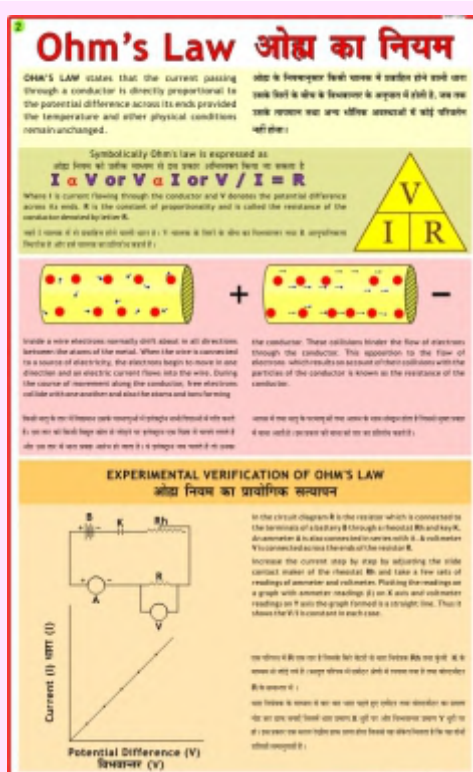
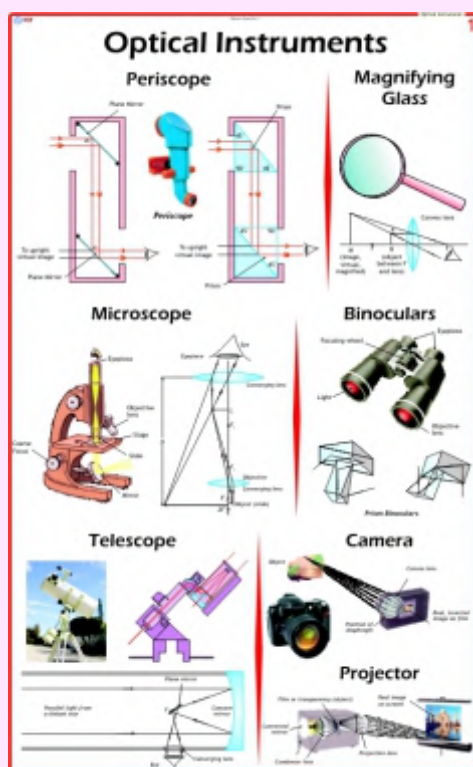
Size: 100 x 70 cm

Laminated Each Rs. 250.00



Size: 55 x 90 cm | English
Laminated: Rs. 250.00 each

- Optical Instruments & Microscope (Hindi-English)
- Ohm's Law (Hindi-English)
- Three Kinds of Levers
- Pulleys (Simple Machines) Revised Edition
- Electromagnetism
- Dynamo (Revised Edition) (Hindi-English)
- Refraction of Light by a Prism (Hindi-English)
- Electrical Symbols
- Petrol Engine
- The Steam Engine
- Pascal's Law
- Newton's Laws of Motion
- Wave Motion
- The Eyes: It's Defects & Remedies
- Diode
- Three Types of Equilibrium (Hindi-English)
- Electroplating
- Metric System of Weights and Measures (Hindi-English)
- Telescope
- Light (Hindi-English)
- X-Ray
- Refraction of Light
- Static Electricity
- Archimedes Principle
- Rockets & Artificial Satellites
- Radioactivity
- Measurements
- Moment & Couple
- Work & Power (Hindi-English)
- Reflection of Light from Mirror
- Refraction of Light through Lenses
- Magnetism
- Wind Energy
- Renewable sources of energy (Hindi-English)
- Heat & Temperature
- Sound
- Different Kinds of Primary Cells
- Electric Current
- Photo-electric Effect
- Microscopes: Compound & Electron Microscopes
- Gravity



[illegible]

Three Types of Equilibrium

तीन प्रकार की साम्यावस्था

States of Equilibrium सम्बन्ध में चित्र

Stable Equilibrium: If the body is displaced from its equilibrium position, it tends to return to its original position. Example: A cone balanced on its base.

Unstable Equilibrium: If the body is displaced from its equilibrium position, it tends to move away from its original position. Example: A cone balanced on its tip.

Neutral Equilibrium: If the body is displaced from its equilibrium position, it remains in its new position. Example: A sphere on a horizontal surface.

Centre of Gravity: The point at which the weight of the body acts as if it were concentrated at that point.

Gravitational Forces on Particles of a Beam: The forces acting on the particles of a beam are gravitational forces. The beam is in equilibrium if the sum of the forces is zero.

Result (Result of Gravitational Forces): The result of the gravitational forces acting on the particles of a beam is a single force acting at the centre of gravity of the beam.

Finding a Centre of Gravity: The centre of gravity of a body can be found by suspending it from a point and finding the point at which it remains in equilibrium.

Electroplating

Electrons flow from the positive electrode (anode) to the negative electrode (cathode). At the anode, copper is oxidized and enters the solution as Cu^{2+} ions. At the cathode, Cu^{2+} ions are reduced and deposited as copper metal.

Labels: Battery, Object to be Plated (Cathode), Positive Electrode (Anode), Acid Solution with Free Copper Ions, copper deposited, copper removed.

The Metric System of Weights & Measures

नाप तौल की दशमिक प्रणाली

Conversion Table showing units and their equivalents.

Unit	Symbol	Equivalent
Length	m	1000 mm
Mass	kg	1000 g
Volume	m ³	1000 l

The International System of Units (SI)

TELESCOPE

A telescope is an instrument designed to aid the observation of remote objects by collecting some form of electromagnetic radiation such as visible light.

1 Optical Telescope: Refracting type

2 Optical Telescope: Reflecting type

3 Radio Telescope

4 High Energy Particle Telescope

LIGHT प्रकाश

ELECTROMAGNETIC WAVES दृश्य प्रकाश की तरंगें

DIFFRACTION AND INTERFERENCE

POLARIZATION OF LIGHT

SPEED OF LIGHT

The speed of light in a vacuum is 3×10^8 m/s.

LASER LIGHT

X-RAYS

X-rays are produced when high-speed electrons strike a metal target. They are used in medicine for imaging and in industry for material testing.

Refraction of Light

What is Refraction?

Refraction is the bending of light as it passes from one medium to another.

Snell's Law

The ratio of the sine of the angle of incidence to the sine of the angle of refraction is constant for a given pair of media.

Refractive Index of a Medium

The refractive index of a medium is the ratio of the speed of light in a vacuum to the speed of light in the medium.

Total Internal Reflection

When light travels from a denser medium to a rarer medium, it can undergo total internal reflection if the angle of incidence is greater than the critical angle.

Static Electricity

Like charges repel. Unlike charges attract.

Gold-leaf Electroscope

Lightning

Archimedes' Principle

Archimedes' principle is the Law of Buoyancy. It states that "buoyancy of a fluid is equal to upward thrust on a body immersed in it is called buoyancy and the upward force is called the buoyant force."

Free body diagram

Physical Balance

Hot Air Balloon Buoyancy

Rockets & Artificial Satellites

Rockets

Journey to the moon and back

Some artificial satellites

Some Space Probes

Radioactivity

Types of Radiation

Alpha particles, Beta particles, Gamma rays.

Radioactive Decay

Alpha Decay: $\text{X} \rightarrow \text{Y} + \text{He}$
Beta Decay: $\text{X} \rightarrow \text{Y} + \text{e}^-$
Gamma Emission: $\text{X} \rightarrow \text{X} + \gamma$

Radioactive Decay Curve

Particles & their Symbols

Particle	Symbol
Alpha particle	α
Beta particle	β
Gamma ray	γ

Measurements

Measurement of Length

Vernier Caliper, Micrometer Screw Gauge.

Measurement of Mass

Physical Balance, Chemical Balance.

Measurement of Volume

Measuring Cylinder, Displacement Method.

MOMENT AND COUPLE

Moment of a Force:
The tendency of a force to rotate the body to which it is applied is called the moment of the force.

Opening a door, Riding a bicycle, Levering a bottle cap.

Moment of a force about a point or axis = Force (F) × Perpendicular distance from the axis to the line of action of the force (L)

Moment of a Force = $F \times L$
Force = $Mg = W$, (W_1 / W_2)
Moment of the Force W , about $O = W_1 \times OA$

Principle of Moments:
When a body acted upon by several forces in one plane, is in equilibrium, the sum of clockwise moments equals the sum of anticlockwise moments.
 $W_1 \times OA = W_2 \times OB = W_3 \times OC$

COUPLE
A pair of equal parallel unlike non collinear forces acting on a rigid body constitutes a couple. It produces rotational motion only.

Opening a tap, Churning of milk, Steering wheel of a car.

WORK & POWER कार्य तथा शक्ति

WORK कार्य
Work is said to be done only when a force produces motion. **कार्य तभी होता है जब बल के कारण वस्तु में गति उत्पन्न हो सके।**

Examples of work being done: खनक में काम, खेत में काम, पहाड़ चढ़ना।

Measurement of work: कार्य का मापन

Work = Force × Displacement
 $W = F \times S$

Unit of Work: Work is a scalar quantity. Unit of work is Joule (J).
1 Joule = 1 Newton-metre (N-m)

Power शक्ति
Power is the rate at which a work is done. **शक्ति वह दर है जिस दर पर कार्य होता है।**

$P = \frac{W}{t}$

Unit of Power: Power is a scalar quantity. It is called a watt (W).
1 watt = 1 joule per second (J/s)

Power is a scalar quantity. It is called a watt (W).
1 watt = 1 joule per second (J/s)

Reflection of Light from Mirror

PLANE MIRROR

Rules for image size and position:
1. The size of an image is equal to the size of the object.
2. The image is laterally inverted.
3. The image is formed at the same distance behind the mirror as the object is in front of it.

CONVEX MIRROR

CONCAVE MIRROR

FORMATION OF IMAGE THROUGH A CONCAVE MIRROR

When the object is between F & P , When the object is at F , When the object is between F & C .

When the object is at C , When the object is beyond C , When the object is at infinity.

FORMATION OF IMAGE THROUGH A CONVEX MIRROR

For an object placed in front of a convex mirror, the image formed is virtual, erect, and diminished. The image is formed behind the mirror.

Transverse Magnification:
Image Height / Object Height = Image Distance / Object Distance

Refraction of Light through Lenses

CONVEX (CONVERGING) LENS

CONCAVE (DIVERGING) LENS

FORMATION OF IMAGES THROUGH A CONVEX LENS

When the object is between F & P , When the object is at F , When the object is between F & C .

When the object is at C , When the object is beyond C , When the object is at infinity.

FORMATION OF IMAGE THROUGH A CONCAVE LENS

Linear Magnification:
Image Height / Object Height = Image Distance / Object Distance

Magnetism

Types of Magnetism and Magnetic Poles

Magnetic Field
The Earth's magnetic field, Magnetic field of a bar magnet, Magnetic field of a solenoid.

ELECTROMAGNETISM & ITS APPLICATIONS
The Right Hand Rule, A Simple Electromagnet, An Electric Bell, A Magnetic Relay.

Wind Energy

Wind Energy
Wind energy is a renewable source of energy. It is harnessed by wind turbines to generate electricity.

How Wind is a Wind Turbine?
The wind turbine consists of a tower, a nacelle, and a rotor. The rotor blades are turned by the wind, which drives a generator to produce electricity.

Heat & Temperature

Heat is a form of energy. It is transferred from one body to another.

TEMPERATURE
Temperature is a measure of the average kinetic energy of the particles of a substance.

HEAT TRANSFER
Conduction, Convection, Radiation.

THERMAL EXPANSION
Solids, Liquids, Gases.

Sound

Sound is a form of energy carried by waves of vibrating particles.

CHARACTERISTICS OF SOUND
Pitch, Loudness, Quality.

REFLECTION OF SOUND WAVES & ECHO

REFRACTION OF SOUND

USES OF ULTRASOUND

DOPPLER EFFECT

Electric Current

Theory of Electricity

What is Electric Current?
 $I = Q/t$
 $Q = I \times t$

Direction of Current

Conductors & Insulators

Direct Current & Alternating Current

Photoelectric Effect

Dual Nature of Light

Photoelectric Effect
When light of a certain frequency strikes a metal surface, it causes the emission of electrons.

Equation: $E = hf$

Photoelectric Effect Diagram

Microscopes

Compound Microscope & Electron Microscope

Construction of an Electron Microscope

Working & Types of Electron Microscope

Gravity

Gravity is a force that attracts two objects towards each other.

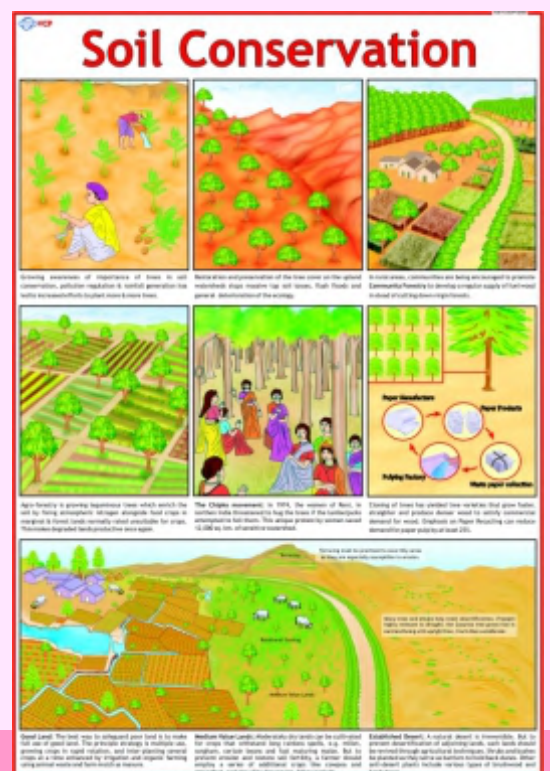
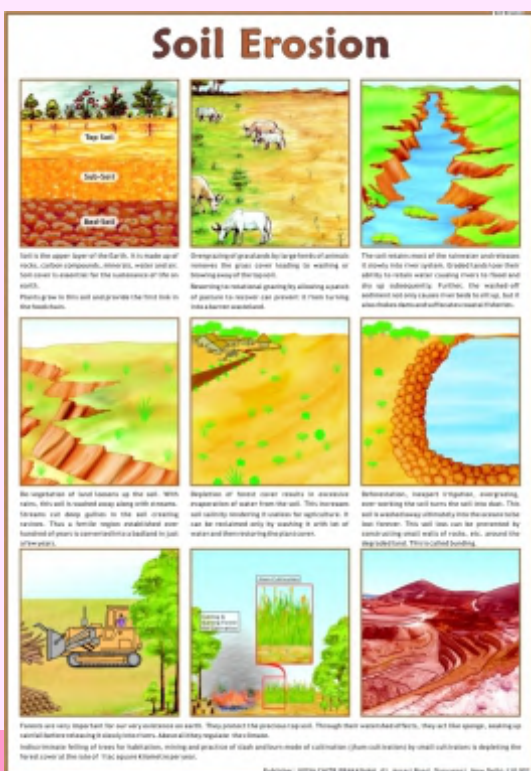
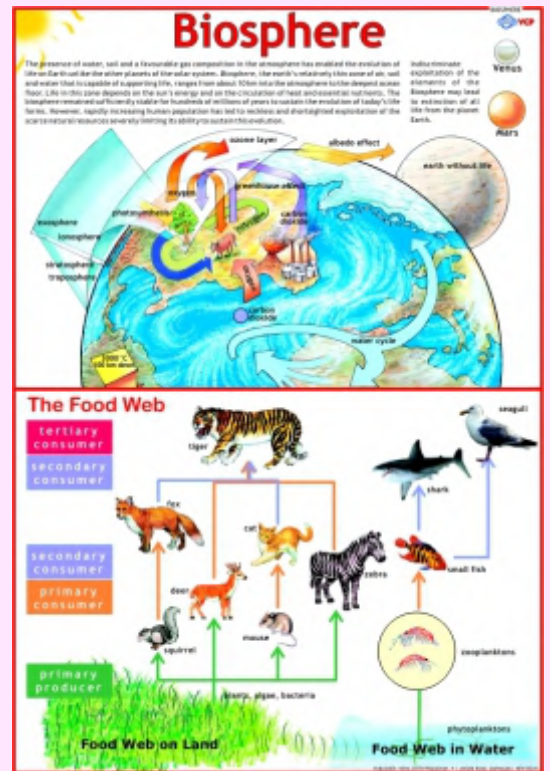
Newton's Law of Gravitation
 $F = G \frac{m_1 m_2}{d^2}$

Center of Gravity

Gravity & Tides

Escape Velocity

1. Biosphere
2. Air Pollution ([Available in Kannada also](#))
3. Water Pollution ([Available in Kannada also](#))
4. Soil Erosion (eng. only)
5. Soil Conservation
6. Oxygen Cycle ([Available in Kannada also](#))
7. Water Cycle ([Available in Kannada also](#))
8. Carbon Cycle ([Available in Kannada also](#))
9. Nitrogen Cycle ([Available in Kannada also](#))
10. Mineral Cycle
11. Sources of Energy
12. Population Explosion
13. Managing Environment
14. Green House Effect & Thermal Inversion
15. Acid Rain & Ozone Layer
16. Bio Gas (Gobar Gas)
17. Waste Management



OXYGEN CYCLE ऑक्सीजन चक्र

ATMOSPHERIC OXYGEN वायुमंडलीय ऑक्सीजन

Subsidiary Diagrams:

- Water Cycle:** Shows the movement of water between the atmosphere, land, and water bodies.
- Carbon Cycle:** Shows the exchange of carbon between the atmosphere, land, and water bodies.

WATER CYCLE जलीय चक्र

Water in the atmosphere वायुमंडलीय जल

Subsidiary Diagrams:

- Oxygen Cycle:** Shows the exchange of oxygen between the atmosphere, land, and water.
- Carbon Cycle:** Shows the exchange of carbon between the atmosphere, land, and water bodies.

Carbon Cycle कार्बन चक्र

CARBON DIOXIDE IN THE ATMOSPHERE वायुमंडलीय कार्बन डाइऑक्साइड

Subsidiary Diagrams:

- Water Cycle:** Shows the movement of water between the atmosphere, land, and water bodies.
- Oxygen Cycle:** Shows the exchange of oxygen between the atmosphere, land, and water.

Nitrogen Cycle नाइट्रोजन चक्र

NITROGEN IN THE SOIL AND IN WATER

Subsidiary Diagrams:

- Water Cycle:** Shows the movement of water between the atmosphere, land, and water bodies.
- Oxygen Cycle:** Shows the exchange of oxygen between the atmosphere, land, and water.
- Carbon Cycle:** Shows the exchange of carbon between the atmosphere, land, and water bodies.

MINERAL CYCLE

Sulphur Cycle

Subsidiary Diagrams:

- Water Cycle:** Shows the movement of water between the atmosphere, land, and water bodies.
- Oxygen Cycle:** Shows the exchange of oxygen between the atmosphere, land, and water.
- Carbon Cycle:** Shows the exchange of carbon between the atmosphere, land, and water bodies.

SOURCES OF ENERGY

SUN: The Global Powerhouse

Renewable Sources of Energy:

- Solar Energy:** Energy from the sun.
- Wind Energy:** Energy from the wind.
- Hydro Energy:** Energy from flowing water.
- Geothermal Energy:** Energy from the earth's internal heat.
- Nuclear Energy:** Energy from nuclear reactions.

Non-Renewable Sources of Energy:

- Fossil Fuels:** Coal, oil, and natural gas.
- Nuclear Power:** Energy from nuclear reactions.

POPULATION EXPLOSION

POPULATION IN INDIA

Unplanned Family: A family that grows without any control.

A Vicious Circle: A cycle of poverty and overpopulation.

Combating over population through rural regeneration: Strategies to improve rural living conditions and reduce population pressure.

Managing Environment

Technology Transfer

Managing Water: Strategies to conserve and manage water resources.

Managing the Environment: Strategies to protect and improve the environment.

GREENHOUSE EFFECT & Thermal Inversion

THE GREENHOUSE EFFECT

THE GREENHOUSE EFFECT: The process by which the earth's atmosphere traps heat, leading to global warming.

THERMAL INVERSION: A phenomenon where the temperature of the air increases with altitude, trapping pollutants near the ground.

ACID RAIN & OZONE LAYER

ACID RAIN

THE OZONE LAYER: A layer of ozone in the stratosphere that protects the earth from harmful ultraviolet radiation.

ACID RAIN: Rain that is acidic due to the presence of sulfuric and nitric acids.

Gobar Gas Plant (Biogas Plant)

गोबर गैस संयंत्र (बायोगैस संयंत्र)

Fixed Dome Type (Lanka Model): A type of biogas plant where the gas is collected in a fixed dome.

Plastic Model: A type of biogas plant where the gas is collected in a plastic bag.

Domestic Model: A type of biogas plant where the gas is collected in a domestic tank.

Laboratory connected Biogas Plant: A type of biogas plant where the gas is collected in a laboratory tank.

Waste Management

Waste Management

Wet Waste: Food and vegetable waste, food waste, animal waste, etc.

Dry Waste: Paper, plastic, glass, metal, etc.

Sanitary Waste: Human and animal excreta, etc.

Garden Waste: Grass, leaves, twigs, etc.

Hazardous Household Waste: Old medicines, pesticides, etc.

Rubbish, Debris: Broken glass, metal, etc.

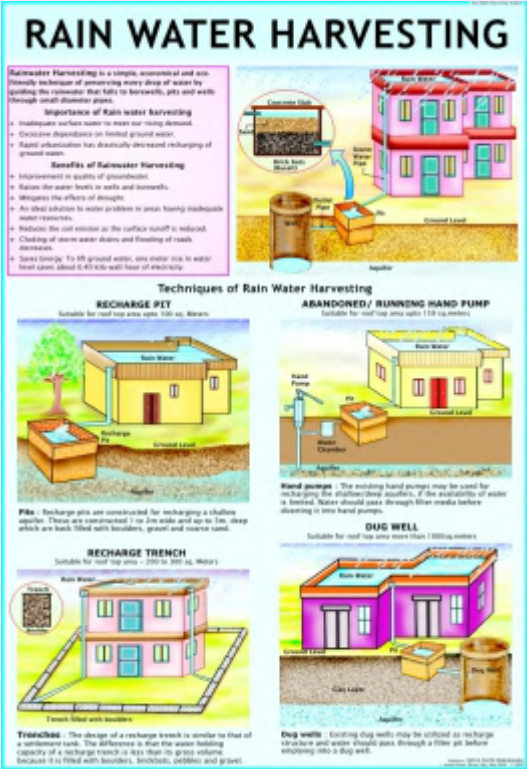
Electronic waste: Old computers, mobile phones, etc.



POLLUTION CHART

Size: 70 X 100 cm | Laminated: Rs. 250.00

English



RAIN WATER HARVESTING

Size: 70 X 100 cm | Laminated: Rs. 250.00 each

Hindi / English

AGRICULTURE CHARTS

Size: 50 x 75 cm

English & Hindi

Laminated: Rs. 160.00 Each

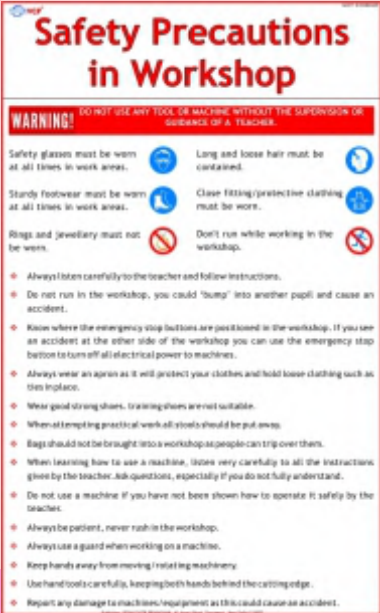
1. Improved Agricultural Implements
2. Crop Pest
3. Gobar Gas Plant (Biogas Plant)
4. Crop Rotation
5. Soil Erosion (Hindi or English)
6. Soil Conservation (Hindi or English)



ENGINEERING SAFETY CHARTS

Size: 55 x 90 cm | Laminated: Rs. 400.00 Each | English

1. Safety Precautions in a Workshop
2. Safety on Lathe Machine
3. Safety on Milling Machine
4. Safety on Drilling Machine
5. Safety in Carpentry
6. Safety in Press Work
7. Safety in Welding
8. Safety in Foundry
9. Safety in Sheet Metal Work
10. Safety in Fitting Shop
11. Safety in an Electrical Laboratory.

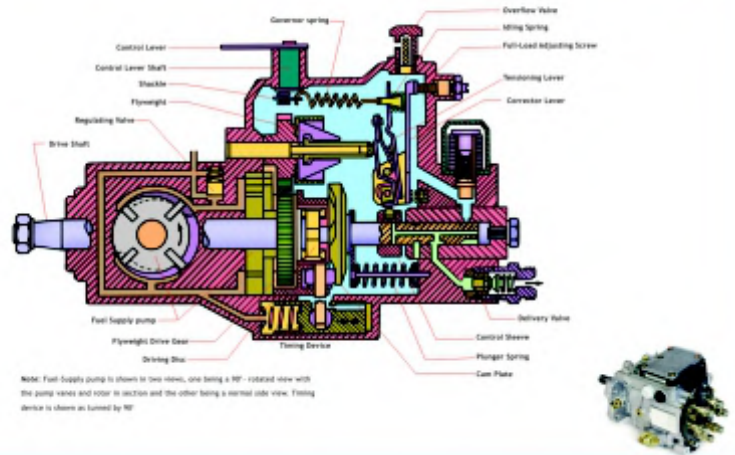


Size: 70 x 100 cm | English

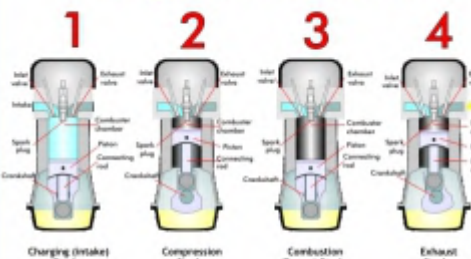
Laminated: Rs. 400.00 each

1. Steering Mechanism without Power Assistance
2. Power Steering Mechanism
3. Engine Function
4. Petrol Engine Cut Section
5. Diesel Engine Cut Section
6. Brake System with Servo Assistance
7. Starter Motor
8. Differential
9. Alternator Cut Section
10. Fuel Injection Pump Cut Section
11. Synchromesh Gear Box Cut Section
12. Automatic Gear Box Cut Section
13. Assembly
14. Brake System without Servo

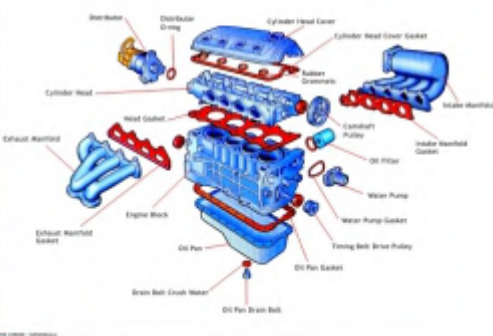
Cross Section: Fuel Injection Pump



Engine Function



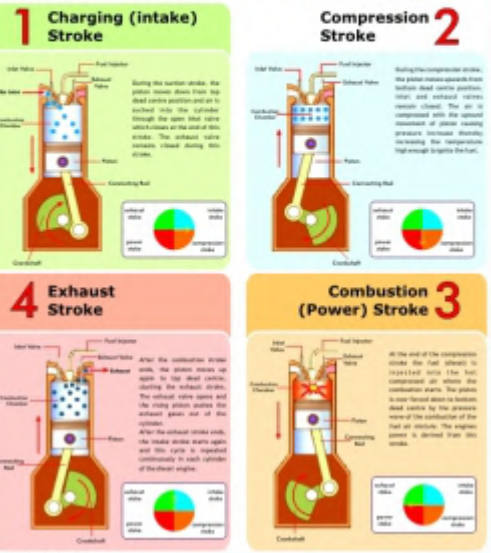
Engine (Exploded View)



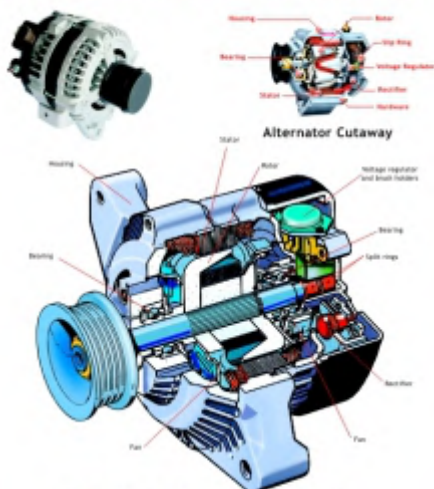
Diesel Engine

Diesel engine is one of the two main types of internal combustion engines used today, the other being spark-ignition engines (found in most motor cars). Invented by Rudolf Diesel, the engine makes use of compression ignition where the fuel, in the form of fuel injected or forced into the engine's cylinders at just the right moment, since gases heat extremely are pressed together, the compression of the air and fuel mixture results in combustion within the cylinder providing power to the engine. Manufactured in two and four stroke versions, diesel engines are widely used in heavy vehicles, construction, ships etc.

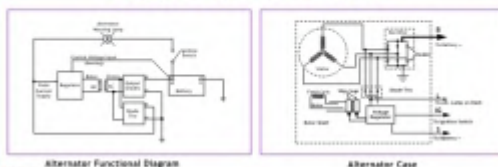
The Four Strokes of a Diesel Engine



An Alternator Cut Section

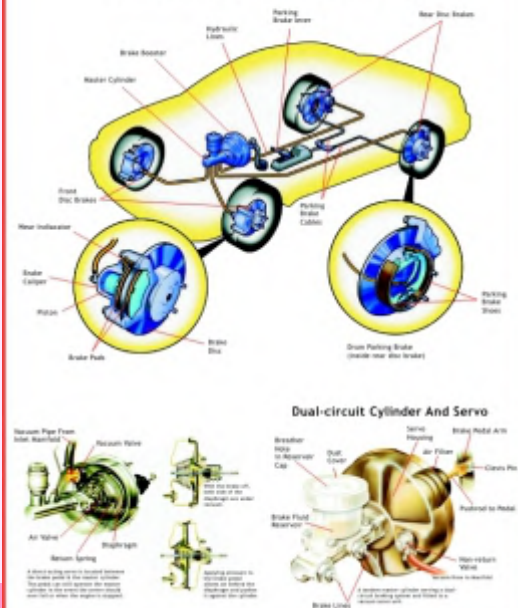


A Typical Alternator Circuit



Brake System With Servo Assistance

Conventional Brake System (non-ABS)



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- [illegible]

Size: 55 x 90 cm | English

Laminated: Rs. 400.00 each

1. Bipolar Junction Transistor
2. Boolean Algebra
3. DC Generator
4. Electric Motor
5. Junction Field Effect Transistor
6. Field Effect Transistor
7. Permanent Magnet Moving Coil Instrument (PMMC)
8. Rectifier
9. Induction Motor
10. Transformer
11. 8051 Microcontroller
12. 8085 Microprocessor Pin Diagram
13. 8085 Microprocessor Block Diagram
14. 8086 Microprocessor
15. Adders & Subtractors
16. Mux & Demux
17. Encoder & Decoder
18. Logic Gates
19. Number System
20. Types of Diodes 1
21. Types of Diodes 2
22. Kirchoff's Law
23. Flip Flop

Bipolar Junction Transistor

A Bipolar Junction Transistor (BJT) is a three-terminal semiconductor device consisting of two pn junctions joined back-to-back. It is a current-controlled device. The three terminals are the emitter, base, and collector. The emitter is the source of charge carriers, the base is the region through which they pass, and the collector is the region where they are collected.

Common Base Mode: The base is connected to ground. The emitter is the input terminal, and the collector is the output terminal. The current gain is less than 1.

Common Emitter Mode: The emitter is connected to ground. The base is the input terminal, and the collector is the output terminal. The current gain is greater than 1.

Common Collector Mode: The collector is connected to ground. The base is the input terminal, and the emitter is the output terminal. The current gain is greater than 1.

Common Base Characteristics: The input resistance is low, and the output resistance is high. The current gain is less than 1.

Common Emitter Characteristics: The input resistance is medium, and the output resistance is high. The current gain is greater than 1.

Common Collector Characteristics: The input resistance is high, and the output resistance is low. The current gain is greater than 1.

Electric Motor

An electric motor is a device that converts electrical energy into mechanical energy. It consists of a stator (the stationary part) and a rotor (the rotating part). The stator is made of coils of wire, and the rotor is made of a coil of wire mounted on a shaft. The current in the stator coils creates a magnetic field, and the current in the rotor coil creates another magnetic field. The interaction between these two fields causes the rotor to rotate.

Construction of an Electric Motor: The motor consists of a stator (the stationary part) and a rotor (the rotating part). The stator is made of coils of wire, and the rotor is made of a coil of wire mounted on a shaft. The current in the stator coils creates a magnetic field, and the current in the rotor coil creates another magnetic field. The interaction between these two fields causes the rotor to rotate.

Working Principle of Electric Motor: The motor works on the principle of the interaction between the magnetic field of the stator and the magnetic field of the rotor. The stator field is stationary, and the rotor field rotates. The interaction between the two fields causes the rotor to rotate.

Flaming's Left Hand Rule: This rule is used to determine the direction of the force on a current-carrying conductor placed in a magnetic field. The thumb points in the direction of the force, the index finger points in the direction of the magnetic field, and the middle finger points in the direction of the current.

Working of Electric Motor: The motor works on the principle of the interaction between the magnetic field of the stator and the magnetic field of the rotor. The stator field is stationary, and the rotor field rotates. The interaction between the two fields causes the rotor to rotate.

Permanent Magnet Moving Coil Instrument (PMMC)

A Permanent Magnet Moving Coil (PMMC) instrument is a type of instrument used for measuring current and voltage. It consists of a permanent magnet, a coil, and a spring. The coil is placed in the radial magnetic field of the permanent magnet. When current flows through the coil, it experiences a torque that causes it to rotate. The rotation is opposed by a spring, and the deflection of the coil is proportional to the current flowing through it.

Working Principle: The PMMC instrument works on the principle of the interaction between the magnetic field of the permanent magnet and the magnetic field of the coil. The coil is placed in the radial magnetic field of the permanent magnet. When current flows through the coil, it experiences a torque that causes it to rotate. The rotation is opposed by a spring, and the deflection of the coil is proportional to the current flowing through it.

Parts of a PMMC: The main parts of a PMMC instrument are the permanent magnet, the coil, the spring, and the scale. The permanent magnet is used to create a radial magnetic field. The coil is placed in this field, and when current flows through it, it experiences a torque. The spring is used to oppose the rotation of the coil, and the scale is used to measure the deflection of the coil.

Advantages: PMMC instruments are accurate, reliable, and have a long life. They are also easy to use and maintain.

Disadvantages: PMMC instruments are expensive and have a low range. They are also sensitive to mechanical shock and vibration.

SINGLE PHASE INDUCTION MOTOR

A single phase induction motor is a type of motor used for driving mechanical loads. It consists of a stator (the stationary part) and a rotor (the rotating part). The stator is made of coils of wire, and the rotor is made of a cage of bars. The current in the stator coils creates a magnetic field, and the current in the rotor bars creates another magnetic field. The interaction between these two fields causes the rotor to rotate.

Parts of an Induction Motor: The main parts of an induction motor are the stator, the rotor, the bearings, and the frame. The stator is made of coils of wire, and the rotor is made of a cage of bars. The bearings support the rotor, and the frame houses the entire motor.

Working of an Induction Motor: The motor works on the principle of the interaction between the magnetic field of the stator and the magnetic field of the rotor. The stator field is stationary, and the rotor field rotates. The interaction between the two fields causes the rotor to rotate.

Advantages: Induction motors are simple, reliable, and have a long life. They are also easy to use and maintain.

Disadvantages: Induction motors are expensive and have a low efficiency. They are also sensitive to mechanical shock and vibration.

TRANSFORMER

A transformer is a device that transfers electrical energy from one circuit to another without a physical connection. It consists of two coils of wire wound around a magnetic core. The primary coil is connected to the AC source, and the secondary coil is connected to the load. The AC current in the primary coil creates a magnetic field, and this field induces a voltage in the secondary coil.

Working Principle Of A Transformer: The working principle of a transformer is based on the principle of electromagnetic induction. When an AC current flows through the primary winding, it creates a magnetic field. This field induces a voltage in the secondary winding, which is proportional to the number of turns in the secondary winding.

Main Constructional Parts Of A Transformer: The main parts of a transformer are the primary winding, the secondary winding, and the magnetic core. The primary winding is connected to the AC source, and the secondary winding is connected to the load. The magnetic core is used to guide the magnetic flux from the primary winding to the secondary winding.

Step Up Transformer: A step up transformer is a transformer in which the secondary voltage is higher than the primary voltage. It is used to increase the voltage of an AC source.

Step Down Transformer: A step down transformer is a transformer in which the secondary voltage is lower than the primary voltage. It is used to decrease the voltage of an AC source.

8085 BLOCK DIAGRAM

The 8085 microprocessor is a 8-bit microprocessor. It consists of a central processing unit (CPU), a bus system, and various control and status signals. The CPU is responsible for executing instructions, and the bus system is used to transfer data and control signals between the CPU and other components.

Architecture: The 8085 microprocessor has a central processing unit (CPU) that is connected to a bus system. The CPU is responsible for executing instructions, and the bus system is used to transfer data and control signals between the CPU and other components. The bus system consists of a data bus, an address bus, and a control bus.

Bus Structure: The bus structure of the 8085 microprocessor is based on the principle of multiplexing. The data bus is used to transfer data between the CPU and other components, and the address bus is used to transfer addresses. The control bus is used to transfer control signals between the CPU and other components.

MULTIPLEXER / DEMULTIPLEXER

A multiplexer is a device that selects one of many inputs and routes it to a single output. A demultiplexer is a device that takes a single input and routes it to one of many outputs. Both devices are used in digital systems to manage data flow.

Multiplexer: A multiplexer is a device that selects one of many inputs and routes it to a single output. It is used to combine multiple data streams into a single stream.

Demultiplexer: A demultiplexer is a device that takes a single input and routes it to one of many outputs. It is used to split a single data stream into multiple streams.

LOGIC GATES

Logic gates are electronic circuits that perform logical operations on one or more binary inputs and produce a single binary output. The most common logic gates are AND, OR, NOT, NAND, NOR, XOR, and XNOR.

Logic Gates: The most common logic gates are AND, OR, NOT, NAND, NOR, XOR, and XNOR. Each gate has a specific symbol and a truth table that defines its operation.

Truth Tables: A truth table is a table that lists all possible combinations of inputs and the corresponding output for a logic gate. It is used to verify the operation of a logic gate.

TYPES OF DIODES

Diodes are semiconductor devices that allow current to flow in one direction but block it in the other direction. There are several types of diodes, including light-emitting diodes (LEDs), photo diodes, laser diodes, and PIN diodes.

Light Emitting Diode (LED): An LED is a diode that emits light when current flows through it. It is used in a wide range of applications, including lighting, displays, and communication.

Photo Diode: A photo diode is a diode that is sensitive to light. It is used in applications such as light detection, imaging, and communication.

Laser Diode: A laser diode is a diode that emits a narrow beam of light. It is used in applications such as laser printing, laser cutting, and laser communication.

PIN Diode: A PIN diode is a diode that has a wide depletion region. It is used in applications such as high-voltage rectification and signal switching.

Kirchoff's Laws

Kirchoff's Laws are fundamental principles of circuit analysis. They are used to determine the current and voltage in a circuit. The first law is the current law, and the second law is the voltage law.

Kirchoff's Current Law: The current law states that the sum of the currents entering a node is equal to the sum of the currents leaving the node. It is used to determine the current in a circuit.

Kirchoff's Voltage Law: The voltage law states that the sum of the voltages around a closed loop is equal to zero. It is used to determine the voltage in a circuit.

Size: 45 x 57 cm | English

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2. Dr. C. V. Raman
3. Galileo Galieli
4. Dr. H. J. Bhabha
5. Sir Isaac Newton
6. Dr. J. C. Bose
7. Madam M. S. Curie
8. Thomas Alva Edison
9. APJ Abdul Kalam
10. Archimedes
11. Birbal Sahni
12. Darwin
13. Louis Pasteur
14. Maghnad Saha
15. Mendeleeev
16. Raja Ramanna
17. Ramanujan
18. Rutherford
19. S N. Bose
20. Vikram Sarabhai



Board Laminated Portraits of Great Scientists

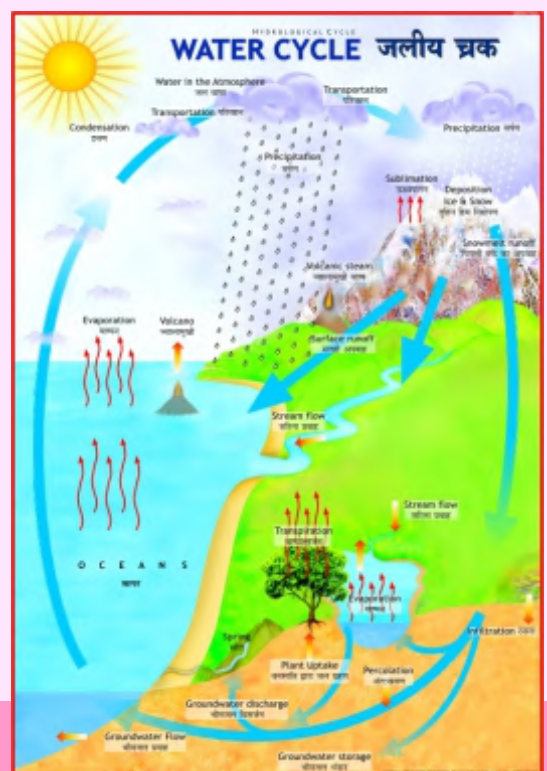
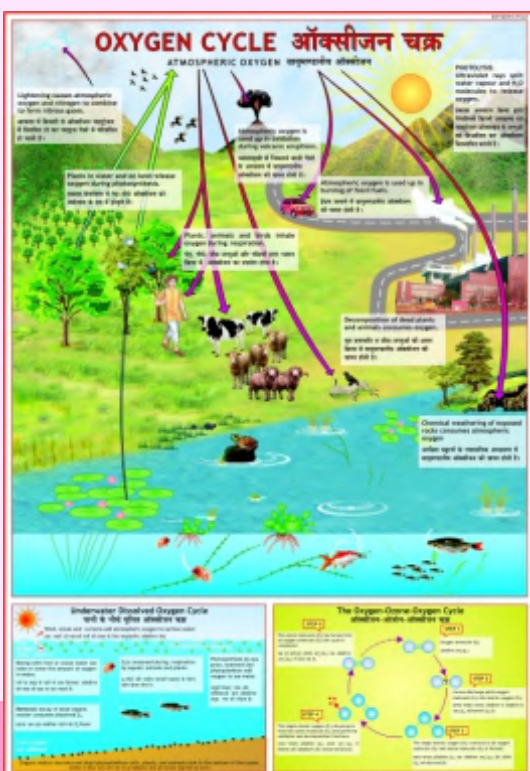
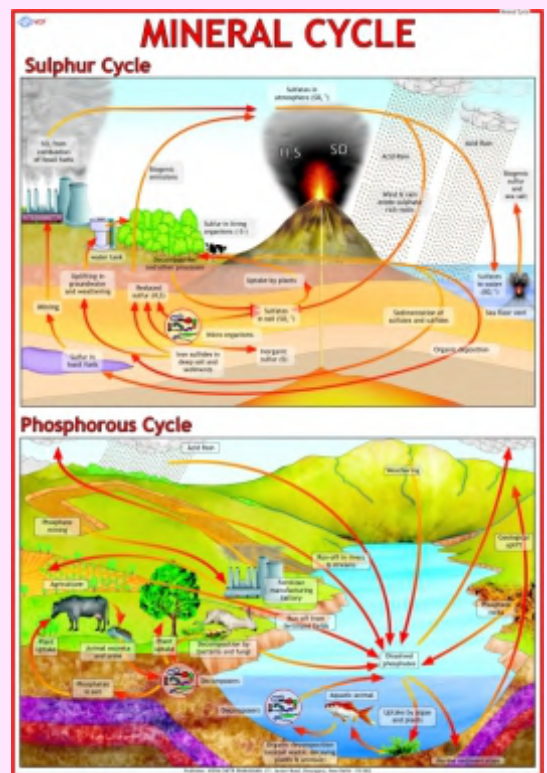
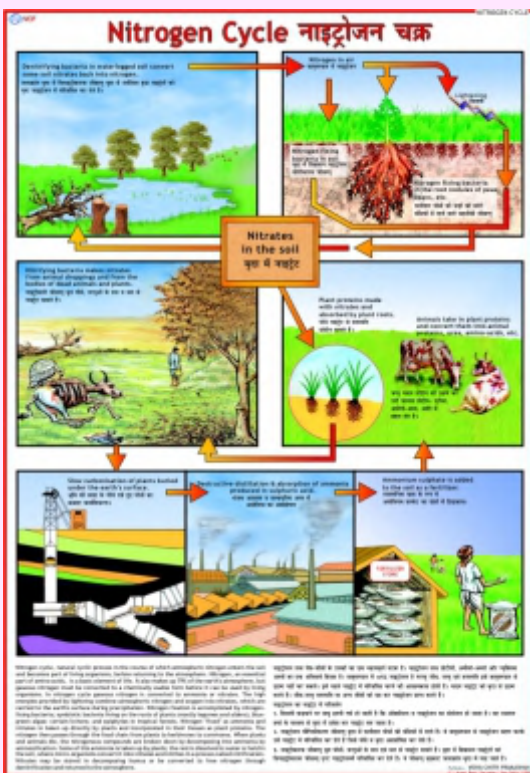
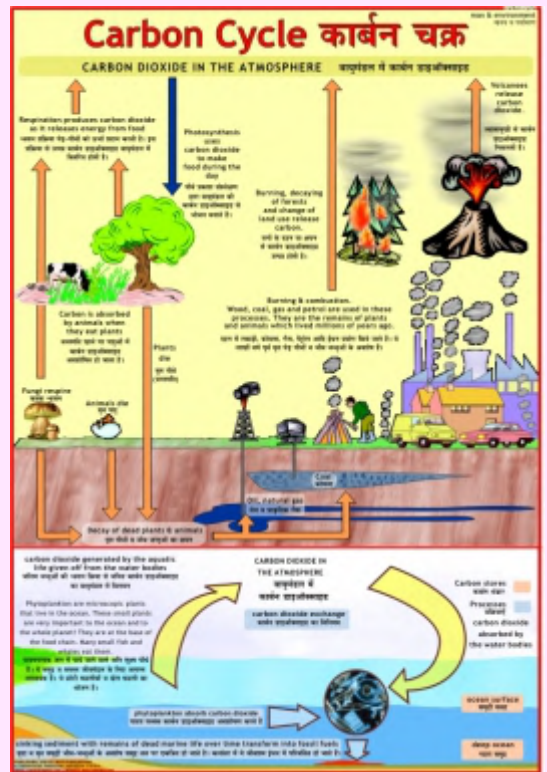
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14. John Dalton
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16. Dr. H.G. Khorana
17. Dr.S.S.Bhatnagar
18. Antoine Laurent
19. Lavoisier
20. William Ramsay
21. Humphry Davy
22. August Weismann
23. Joseph Priestley
24. Aristotle
25. Dmitri I. Mendeleeff
26. Burbank Luther
27. S.N. Bose
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29. K.S. Krishnan
30. K.N. Bahl
31. J.J. Thomson
32. Neils Bohr
33. Gilbert Newton Lewis
34. A.P.J. Abdul Kalam
35. Dr. Vikram Sarabhai
36. Dr. S.S. Joshi
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38. D. Mata Parshad
39. Benjamin Franklin
40. Ernest Rutherford
41. Dr. Raj Ramanna
42. Nicholas Copernicus
43. Alessandro Volta
44. Alfred Nobel
45. Anton Henry Bequerel
46. Otto Von Guericke
47. Benjamin Thomson
48. Watson
49. Edward Victor Appleton
50. James Clark Maxwell
51. Joseph Gay Lussac
52. Johannes Keppler
53. Max Plank
54. James Watt
55. Andre Marie Ampere
56. A. Graham Bell
57. Robert Hooke
58. Guglielmo Marconi
59. Wilhelm Roentgen
60. Albert Einstein
61. Dr. C.V. Raman
62. Galileo Galieli
63. Dr. H J Bhabha
64. Sir Isaac Newton
65. Dr. J C Bose
66. Madam M S Curie
67. Thomas Alva Edison

Minimum order quantity for such portraits is ten (assorted or otherwise)

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2. Nitrogen Cycle
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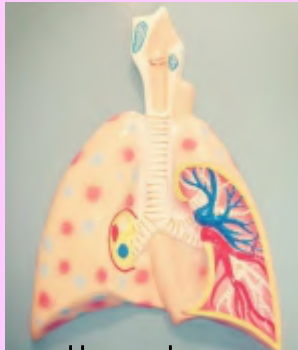


3-D Fibre Glass HUMAN PHYSIOLOGY MODELS			41
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20.Human Skeleton Model 55 x 23 cms			Rs. 600.00
21.Human Head & Neck 25 x 38 cms			Rs. 600.00
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23.Human Mouth 25 x 38 cms			Rs. 600.00
24.Human Tongue			Rs. 600.00
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26.Human Teeth (Small Size)			Rs. 600.00
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28.Human Stomach 25 x 38 cms			Rs. 600.00
29.Human Liver			Rs. 600.00
30.Human Kidney 25 x 38 cms			Rs. 600.00
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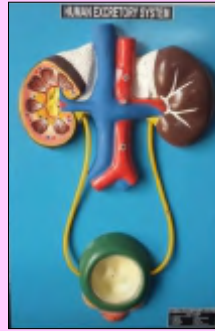
HUMAN PHYSIOLOGY: Sample Images



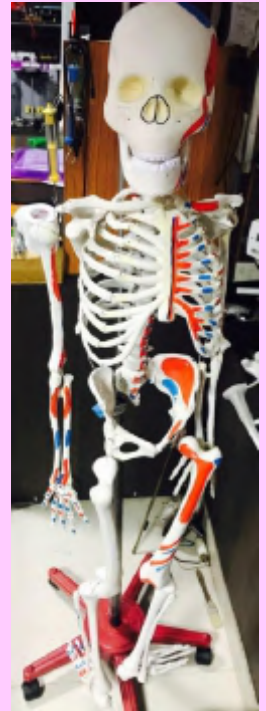
Female Pelvic w/Foetus



Human Lungs



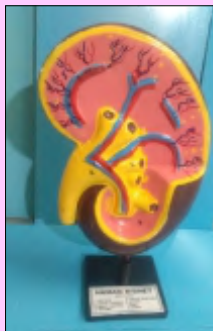
Human Excretory Sys.



Human Skeleton



Human Heart



Human Kidney



Human Eye



Small H. Torso Sexless



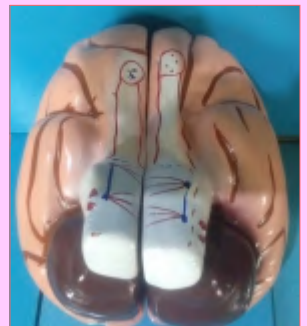
Human Ear



Hip Joint

Human
Teeth

Human Brain



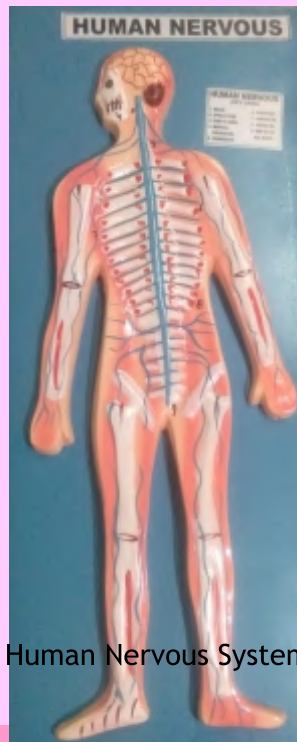
Human Brain



Knee Joint



Skin



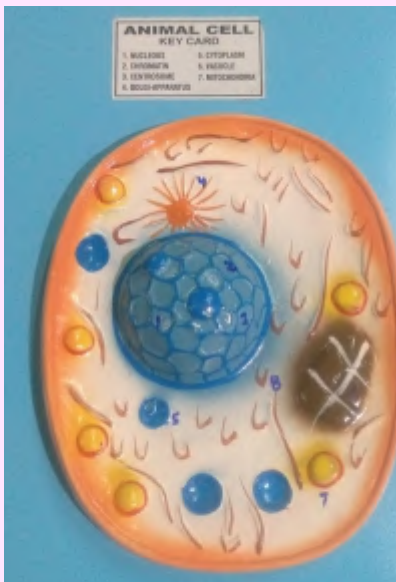
Human Nervous System

Human Circulatory
System

Human Teeth

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T S Dicot Stem	25x38 cm (10"x15")	600.00	small	550.00
T S Monocot Root	25x38 cm (10"x15")	600.00	small	550.00
T S Dicot Root	25x38 cm (10"x15")	600.00	small	550.00
T S Monocot Leaf	25x38 cm (10"x15")	600.00	small	550.00
T S Dicot Leaf	25x38 cm (10"x15")	600.00	small	550.00
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Mitosis	25x38 cm (10"x15")	800.00	small	550.00



Animal Cell



Plant Cell



Monocot Stem



R.N.A



D.N.A



Chloroplast

