



DESIGN CHECKMATES

PH:- +91 – 9164866204 , E-MAIL :- designcheckmates@gmail.com

ABOUT US :

We are a company that was established in 2012 with a simple, deeply committed vision to unleash the power of Engineering. We work on various model outsourcing based on the customer needs and to name few are Build Operate Transfer, On-site/ Offshore outsourcing and Co-Managed Outsourcing.

MISSION STATEMENT :

At ' Design checkmates ', we focus on supporting customers on regular basis by providing quality services within the time and budget. We continuously work on enhancing skills to bring more productivity and to make the process faster.

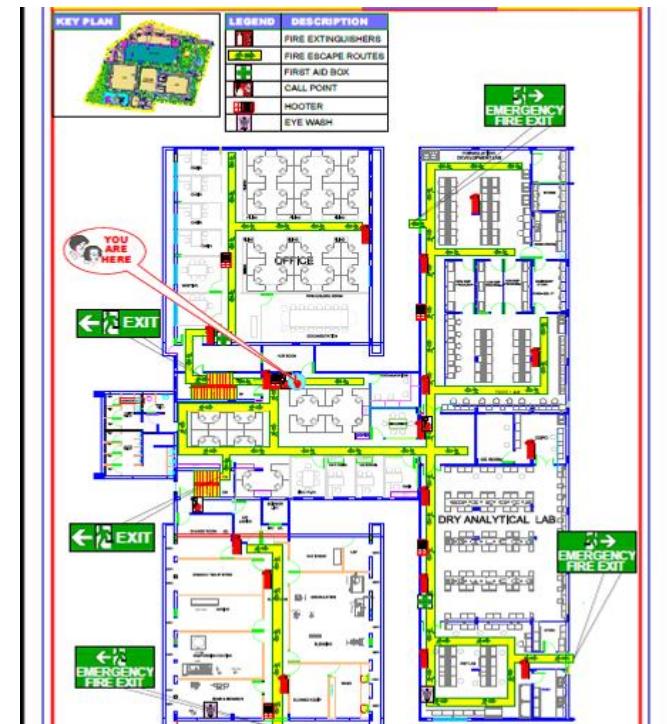


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FIRE ESCAPE ROUTE PLAN AND THE FIRE PROCEDURE:

A fire Escape Route plan (FERP) is a written document which includes the action to be taken by all staff in the event of fire and the arrangements for calling the fire brigade. It can include any relevant information in relation to the FERP.





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THE IMPORTANCE OF SAFETY SIGNS :

At Design Checkmates we have the widest range of legends for you to choose from to ensure you can create a safe, well identified facility. Our range of Safety Signs are designed to meet Indian Standard which outlines specific parameters for safety signs in an occupational environment. This standard sets out the requirements for the design and use of safety signs intended for use in the occupational environment.

These signs are designed to regulate and control safety related behavior, to warn of hazards and to provide emergency information including fire protection information.

CHOOSING SIGNS TO SUIT YOUR APPLICATION



MANDATORY SIGNS

These signs specify an instruction that must be carried out. Symbols (or "pictograms") are depicted in white on a blue circular background. Sign wording, if necessary, is in black lettering on a white background.



PROHIBITION SIGNS

These signs that specify behaviour or actions which are not permitted. The annulus and slash is depicted in red over the action symbol in black. Sign wording, if necessary, is in black lettering on a white background.



WARNING SIGNS

These signs warn of hazards or a hazardous condition that is not likely to be life-threatening. The hazard symbol is black on a yellow background and a triangle is depicted around the hazard symbol. Sign wording, if necessary, is in black lettering on a yellow background.



DANGER SIGNS

These signs provide warning when a hazard or a hazardous condition is likely to be life-threatening. The word "Danger" is featured inside a red oval inside a black rectangle.



EMERGENCY INFORMATION SIGNS

These signs indicate the location of, or directions to emergency related facilities (exits, first aid, safety equipment, etc). Feature a white symbol and/or text on a green background.



FIRE SIGNS

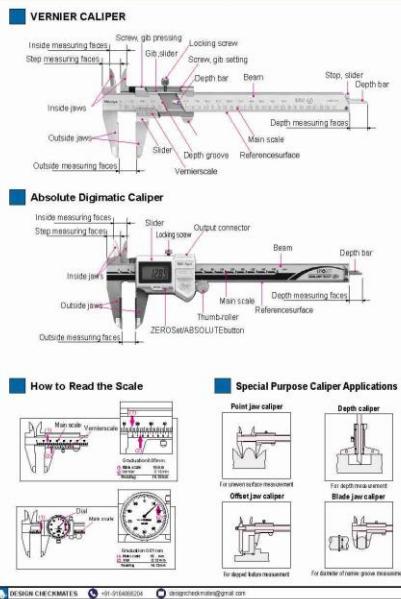
Advise the location of fire alarms and fire fighting equipment. They contain a white symbol and/or text on a red background.



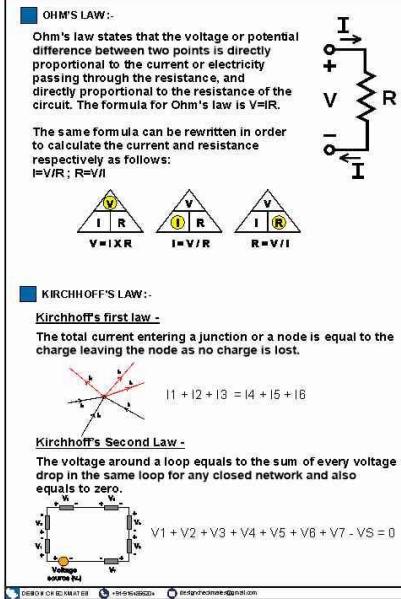
GENERAL INFORMATION SIGNS

These signs are not referred in Indian standards, however are available due to popular demand. They communicate information of a general nature and often refer to Housekeeping, Company Practices and Logistics.

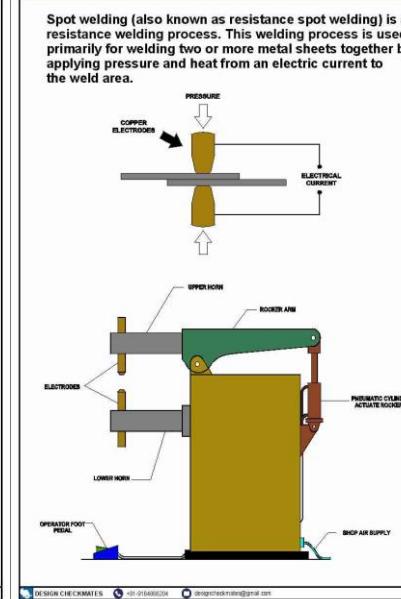
VERNIER CALIPER PARTS NAME & PRINCIPLE



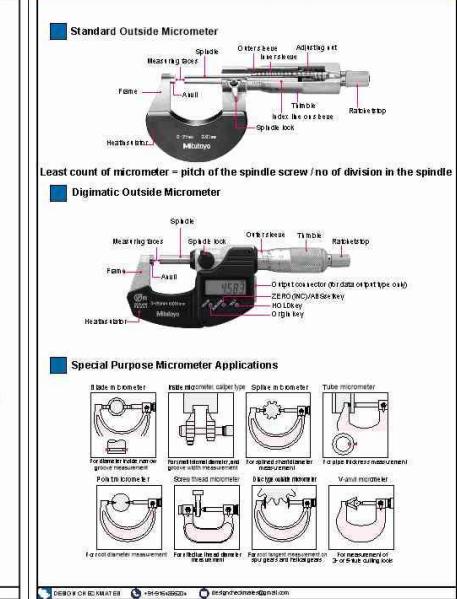
OHM'S LAW AND KIRCHHOFF'S LAW



SPOT WELDING

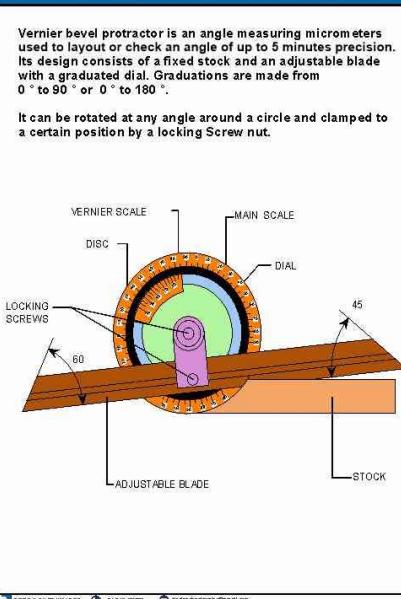


MICROMETER PARTS NAME & PRINCIPLE



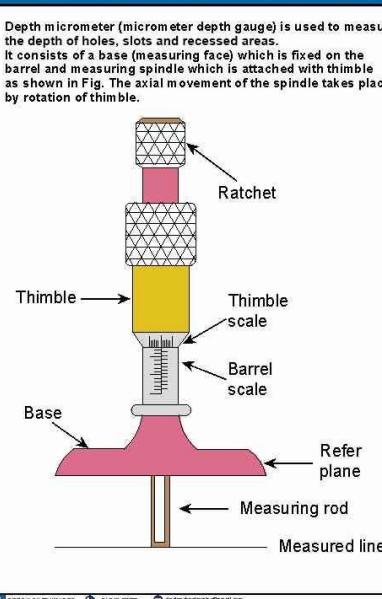
DC-A-01

VERNIER BEVEL PROTRACTOR PARTS & PRINCIPLE



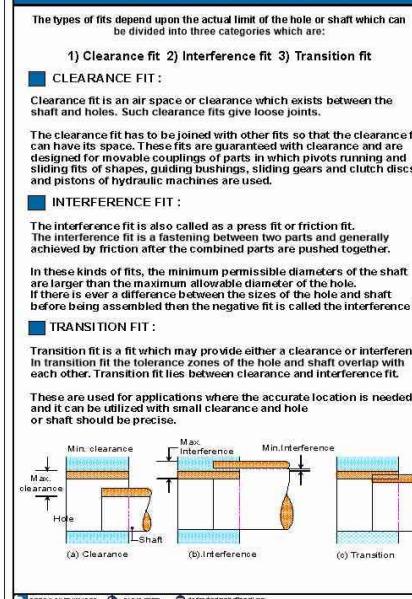
DC-A-02

DEPTH MICROMETER PARTS & PRINCIPLE

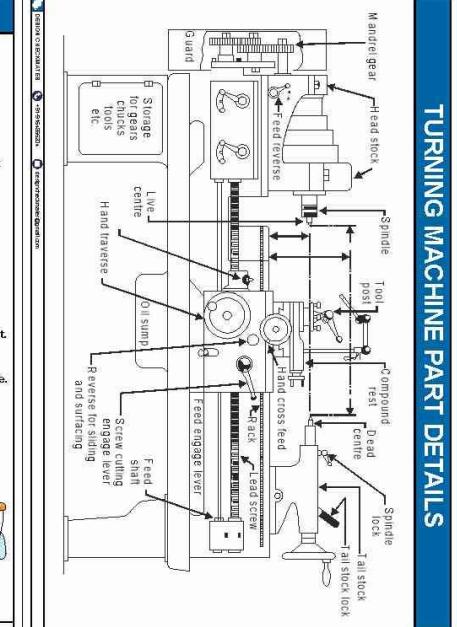


DC-A-03

CLASSIFICATION OF FITS



DC-A-04



TURNING MACHINE PART DETAILS

DC-A-05

DC-A-06

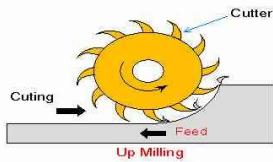
DC-A-07

DC-A-08

UP MILLING & DOWN MILLING

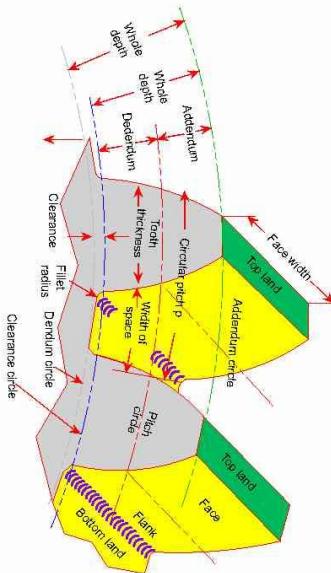
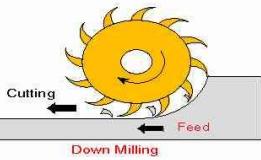
UP MILLING :

The up milling is also called as conventional milling or Climb up milling in which the cutter and feed moves in opposite direction i.e. the rotary cutter moves against the feed. With reference to the adjacent figure, you can see that the cutter rotates in anti-clockwise direction while the direction of feed is from right to left.

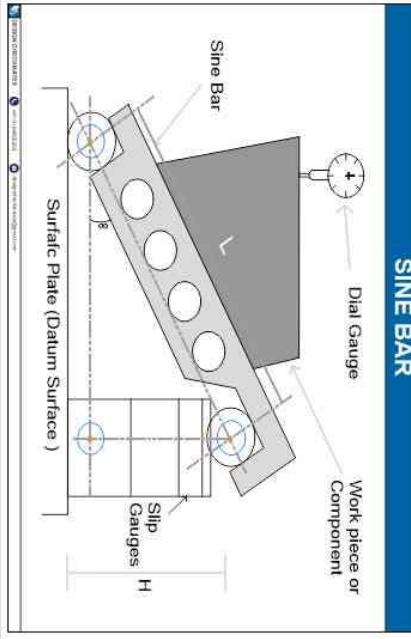


DOWN MILLING :

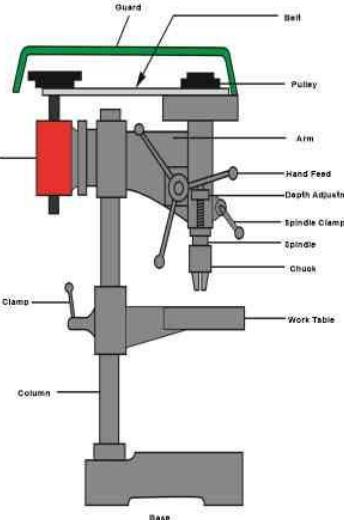
In case of down milling, the cutter rotates in the same direction as that of the feed. You can see, that in down milling there is less friction involved between the cutter and the workpiece as both i.e. cutter and feed are moving in the same direction.



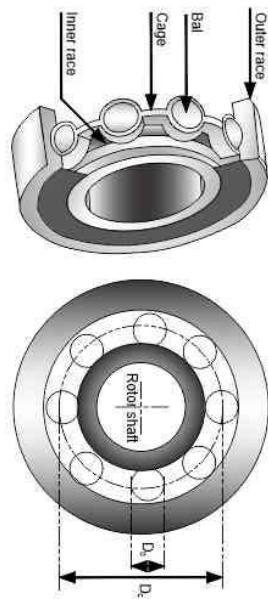
ELEMENTS OF SPUR GEAR



DRILLING MACHINE PARTS NAME

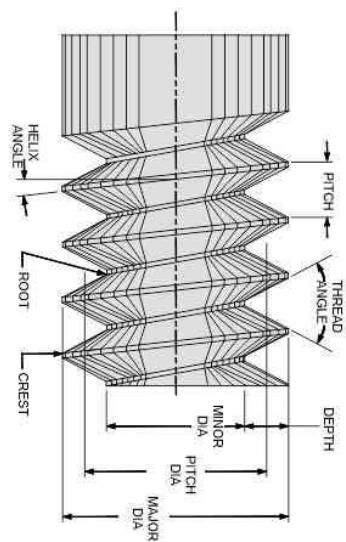


DC-A-09

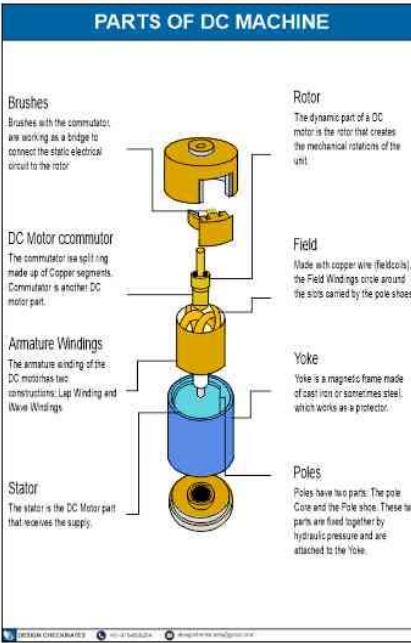


BEARING EXPLDED VIEW

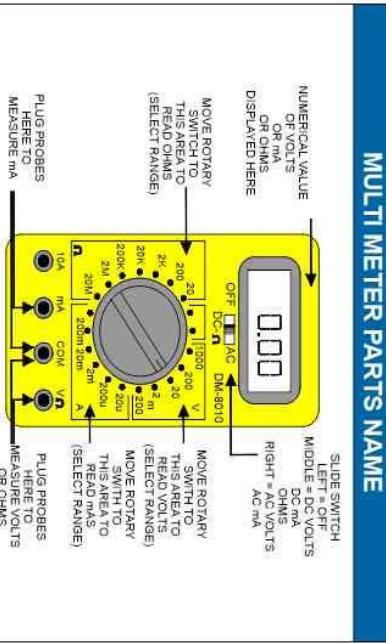
DC-A-10



METRIC THREAD DIAGRAM



DC-B-01



DC-B-03

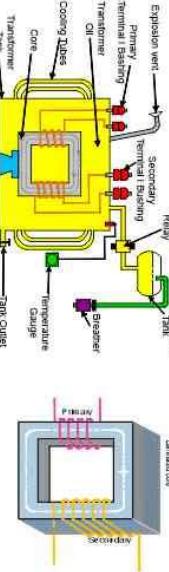
DC-B-04

DC-B-05

DC-B-06

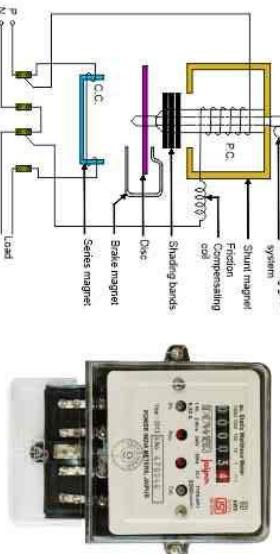
MULTI METER PARTS NAME

TRANSFORMERS PRINCIPLE



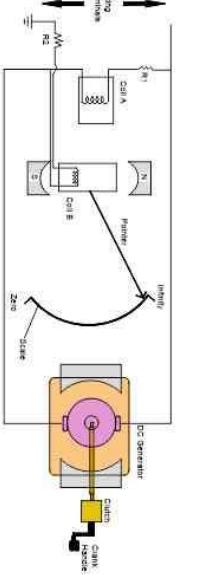
The transformer works on the principle of Faraday's law of electromagnetic induction and mutual induction. There are two coils, primary coil and secondary coil on the transformer core. These two coils have high mutual induction. When an alternating current passes through the primary coil it creates a varying magnetic flux. As per Faraday's law of electromagnetic induction, this change in magnetic flux induces an emf (electromotive force) in the secondary coil which is linked to the alternating primary coil. This is mutual induction.

SINGLE PHASE ENERGY METER



INTERNAL CONNECTION OF MEGGER

Megger is used to measure a high value of resistance. Megger consists of the following parts.

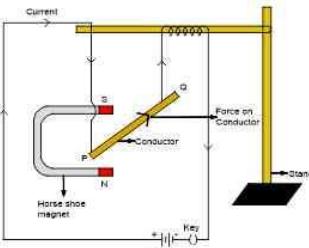


CURRENT CARRYING CONDUCTOR IN A MAGNETIC FIELD

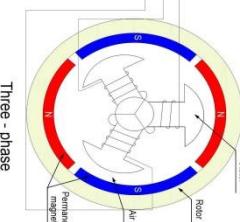
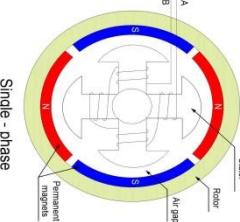
A current carrying conductor produces a magnetic field around it, i.e. behaves like a magnet and exerts a force when a magnet is placed in its magnetic field. Similarly a magnet also exerts equal and opposite force on the current carrying conductor. The direction of this force can be determined using Fleming's left-hand rule.



When a current-carrying conductor is placed in a magnetic field, the conductor experiences a force which is responsible for the movement of the conductor. The current-carrying conductor acts as an electromagnet and generates its own magnetic field around it, because of the moving charges in the conductor.

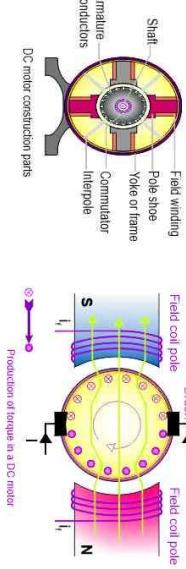


DC-B-07

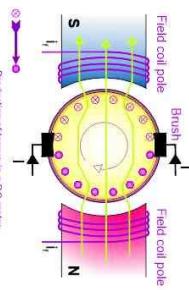


1 PHASE AND 3 PHASE AC INDUCTION MOTOR

A DC motor is defined as a class of electrical motors that convert direct current electrical energy into mechanical energy.

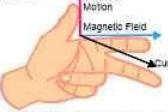


DC-C-02

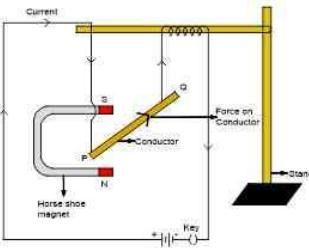


CURRENT CARRYING CONDUCTOR IN A MAGNETIC FIELD

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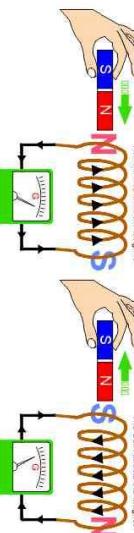


DC-B-08

DC-B-09

The induced electromotive force with different polarities induces a current whose magnetic field opposes the change in magnetic flux through the loop in order to ensure that original flux is maintained through the loop when current flows in it.

An induced current always flows in a direction such that it opposes the change which produced it.



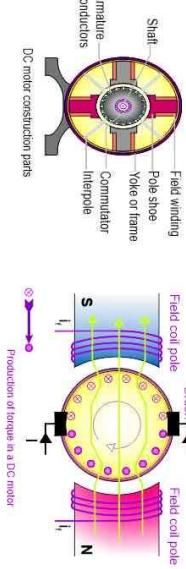
when the 'N' Pole of the magnet is moved towards the coil end of the coil becomes 'N' Pole.

away from the coil end of the coil becomes 'S' Pole

LENZ'S LAW

A DC motor is defined as a class of electrical motors that convert direct current electrical energy into mechanical energy.

DC MOTOR



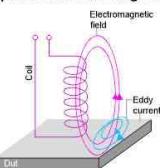
DC-C-03

DC-C-04

EDDY CURRENT AND HYSTERESIS LOOP

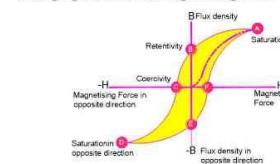
EDDY CURRENT :

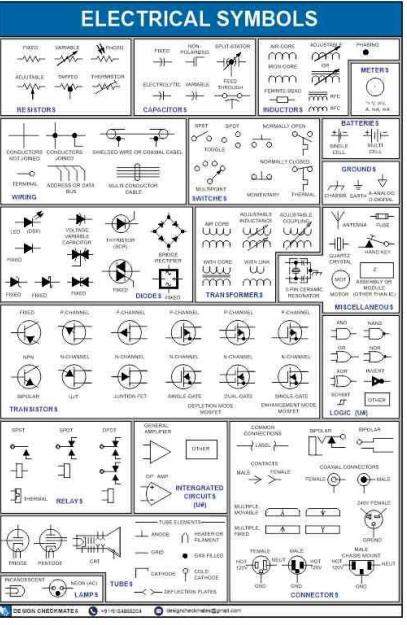
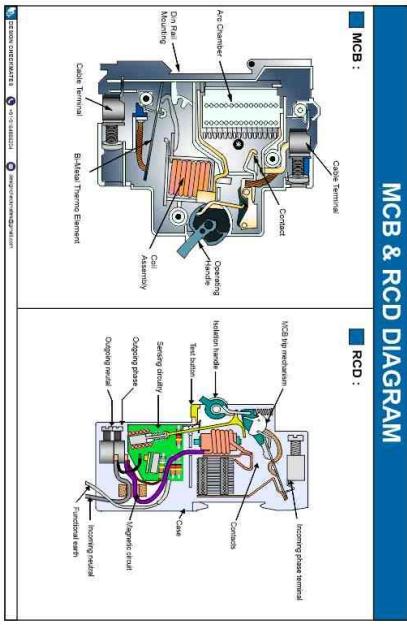
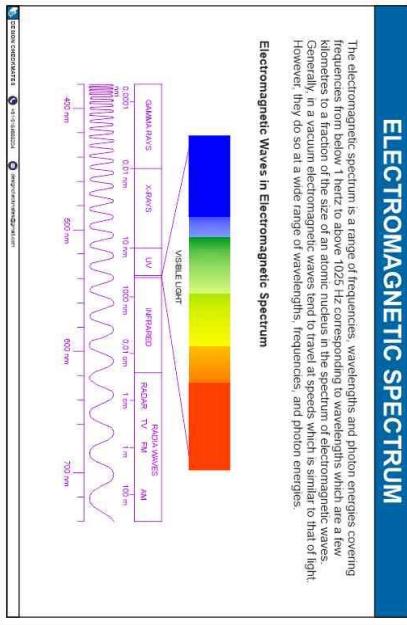
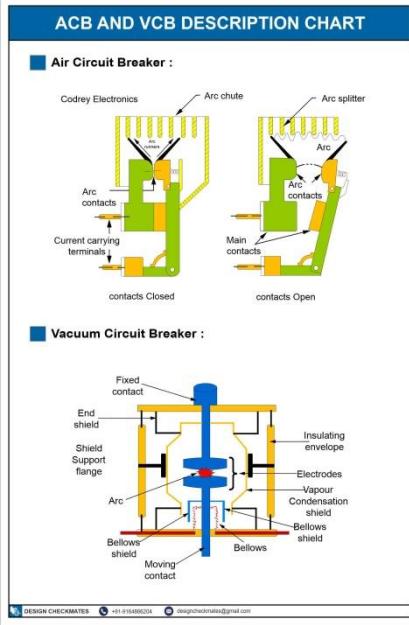
Eddy currents are loops of electrical current induced within conductors by a changing magnetic field in the conductor according to Faraday's law of induction. Eddy currents flow in closed loops within conductors, in planes perpendicular to the magnetic field.



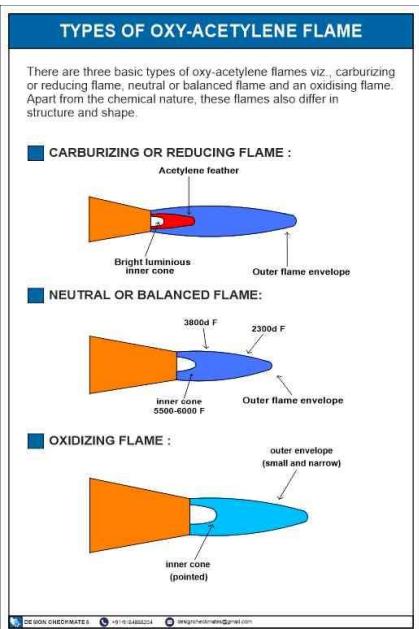
HYSTERESIS LOOP :

The hysteresis loop shows the relationship between the magnetic flux density and the magnetizing field strength. The loop is generated by measuring the magnetic flux coming out from the ferromagnetic substance while changing the external magnetizing field.

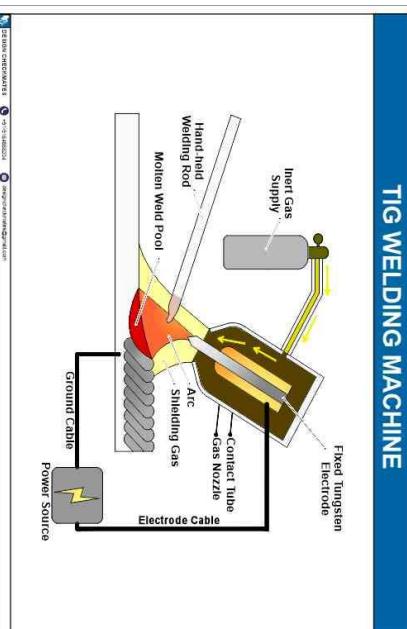




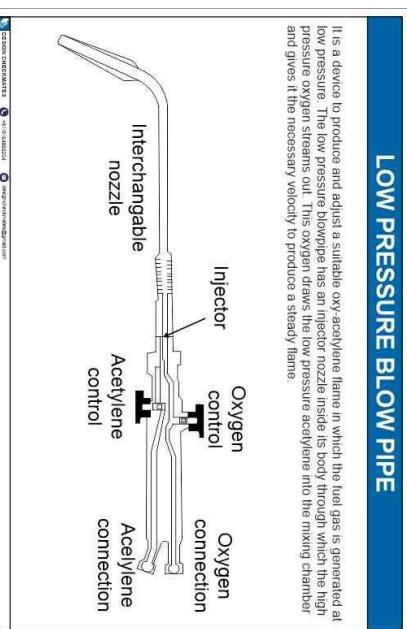
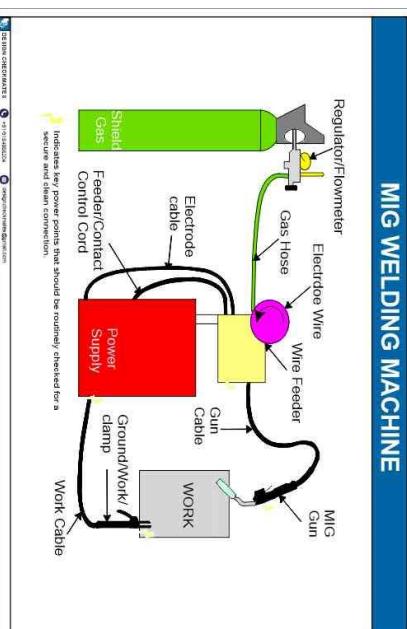
DC-C-05



DC-C-06



DC-C-07

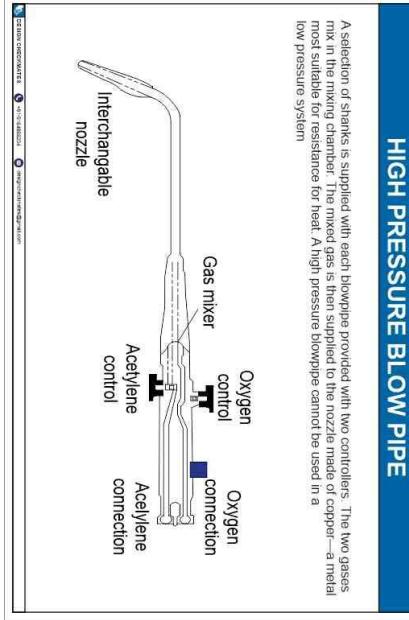


DC-C-09

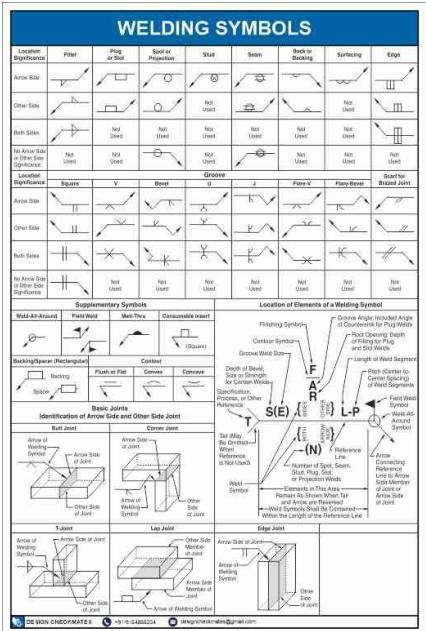
DC-C-10

DC-D-01

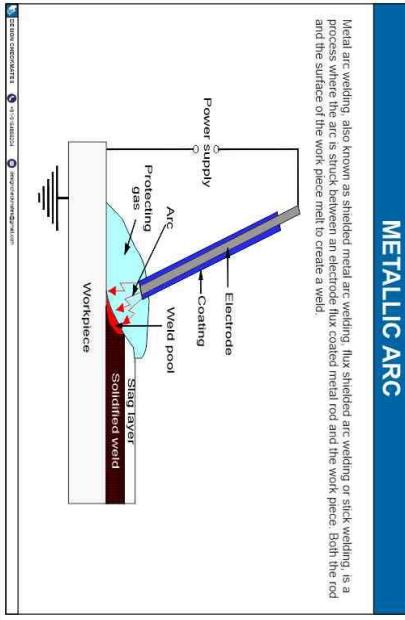
DC-D-02



DC-D-03



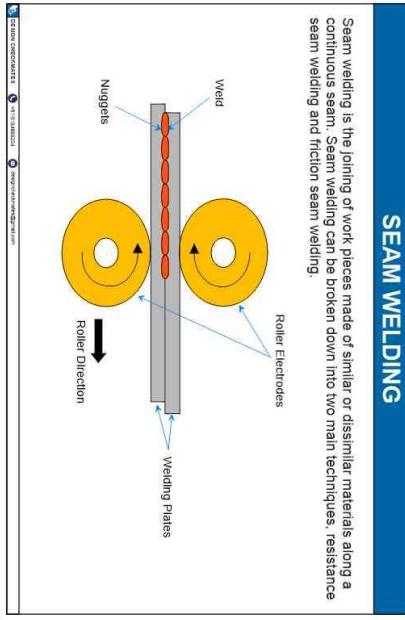
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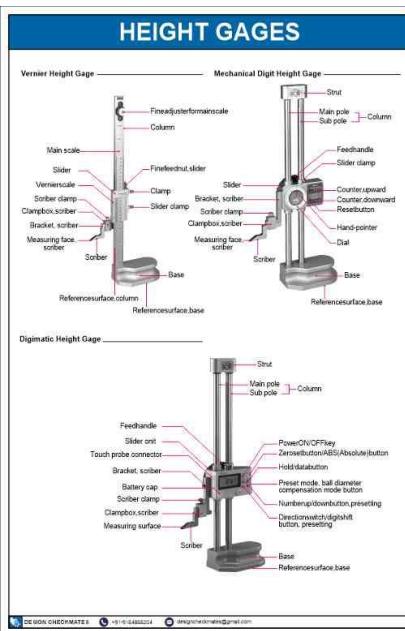
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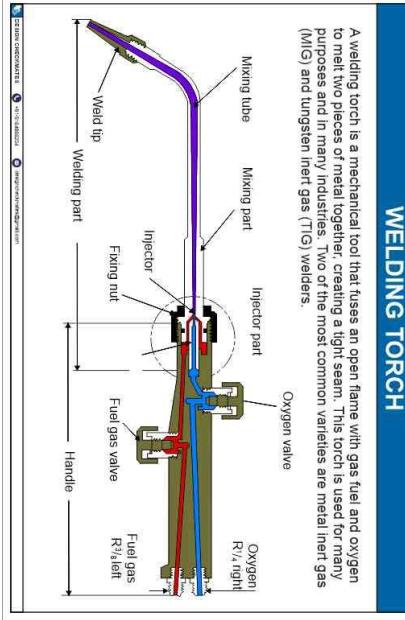
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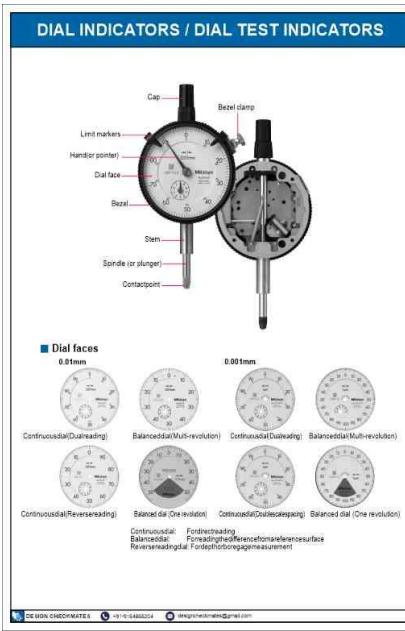
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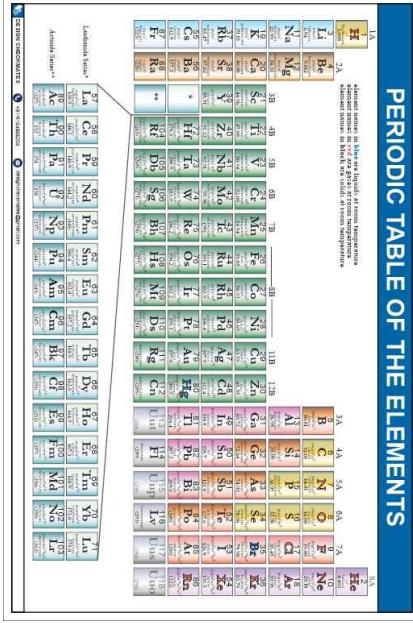
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DC-D-06

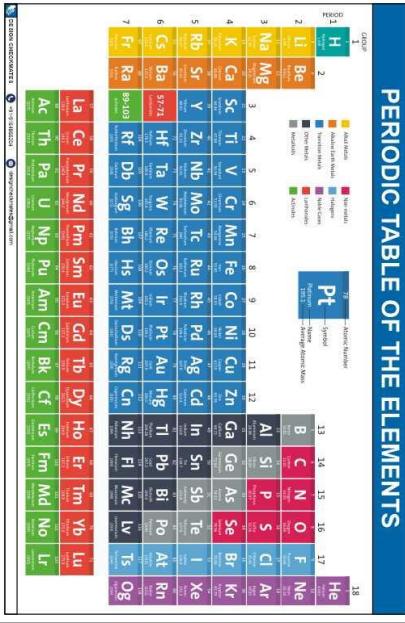


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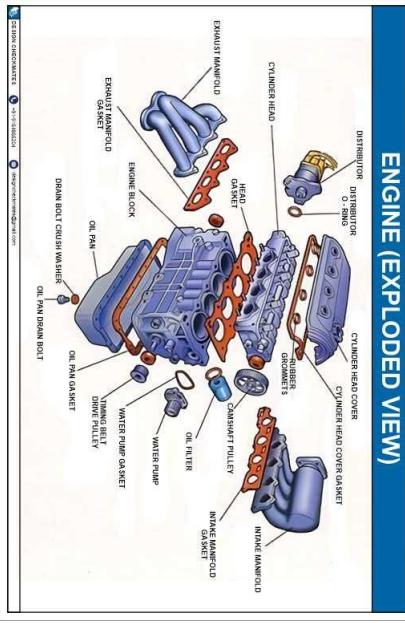


PERIODIC TABLE OF THE ELEMENTS

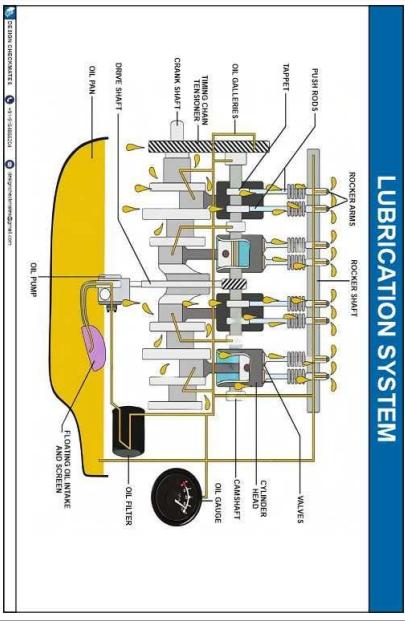
DC-E-01



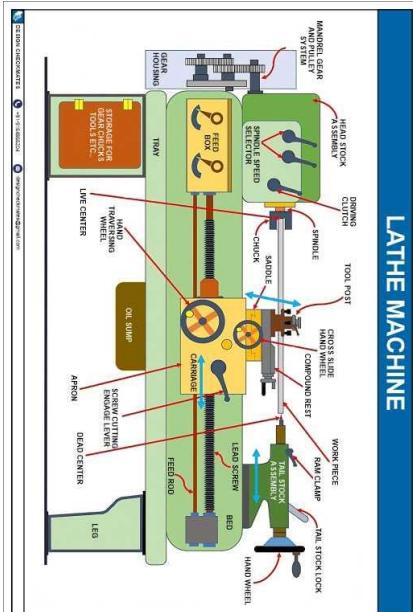
DC-E-02



DC-E-03

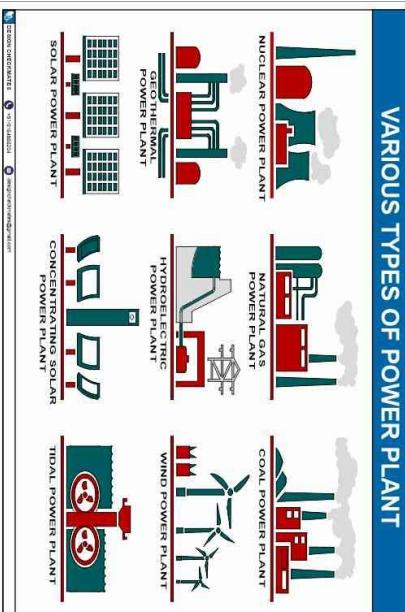


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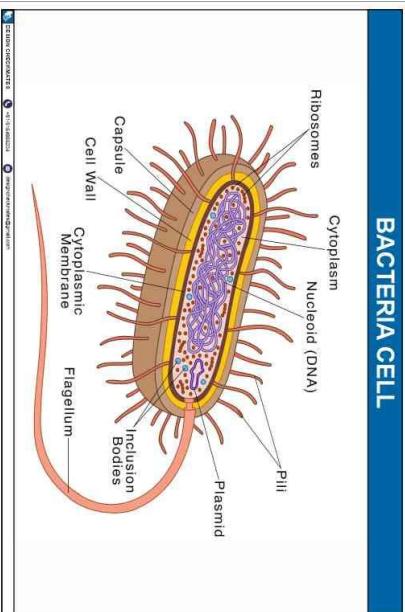


LATHE MACHINE

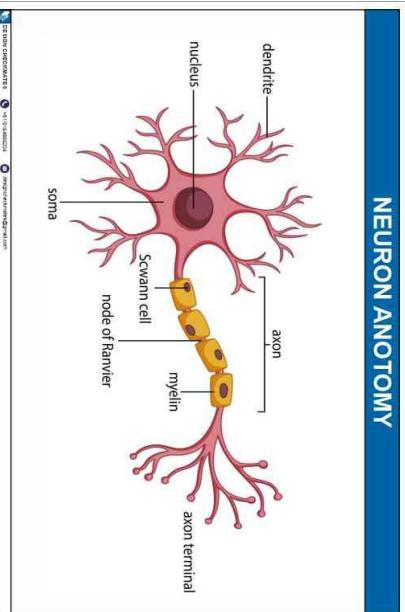
C-E-05



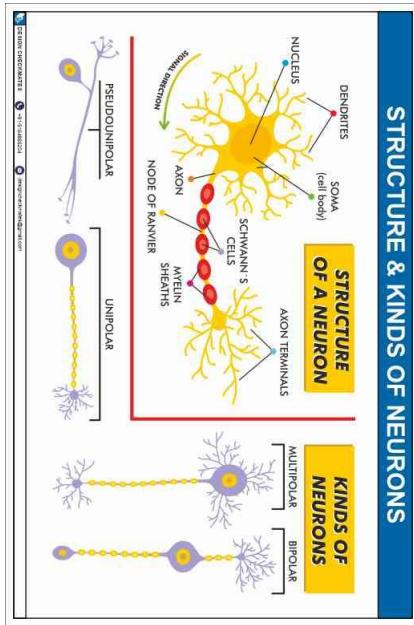
DC-F-01



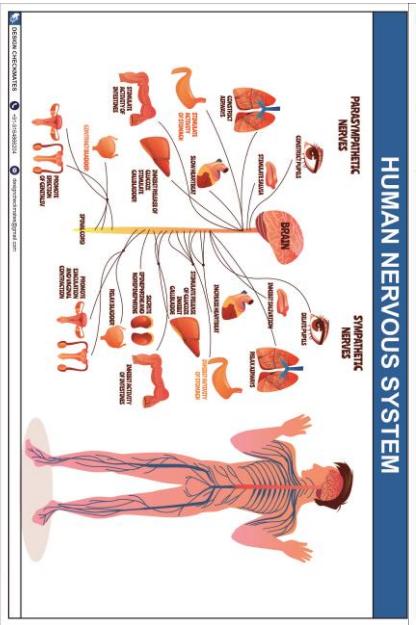
DC-F-02



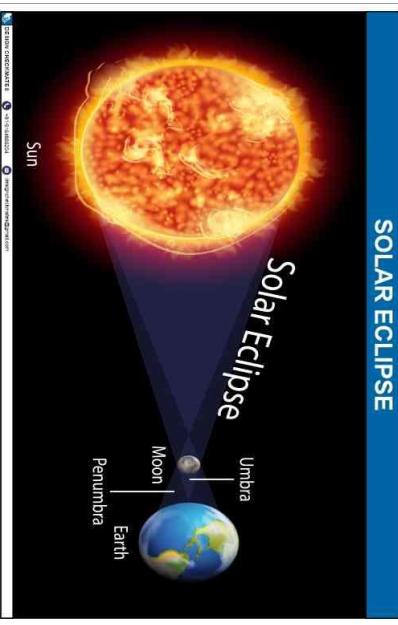
DC-F-03



DC-F-04



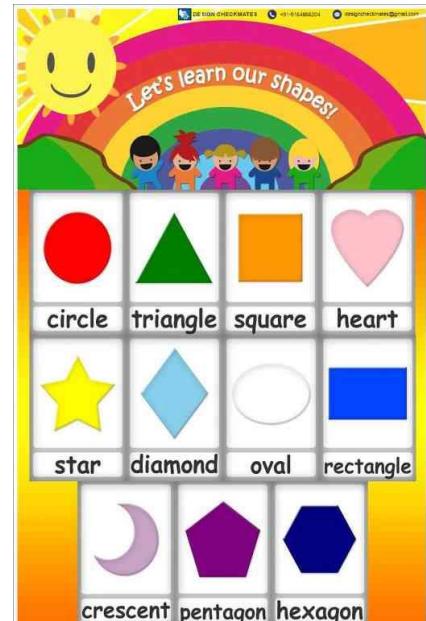
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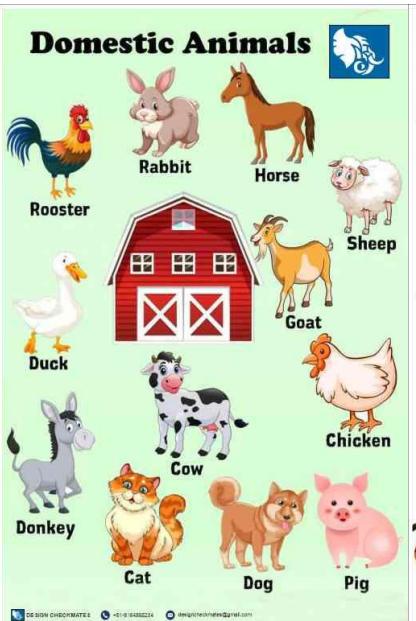
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DC-F-07



DC-G-01



DC-G-02



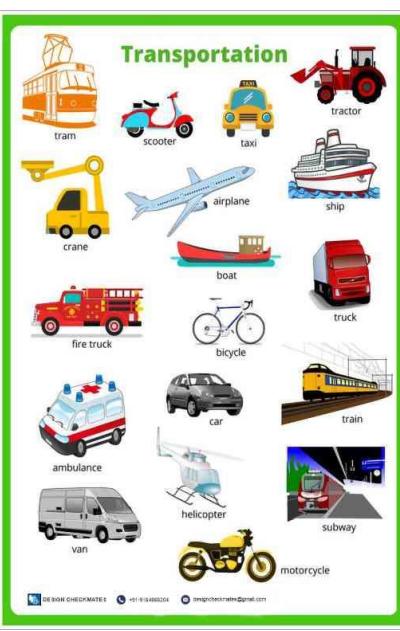
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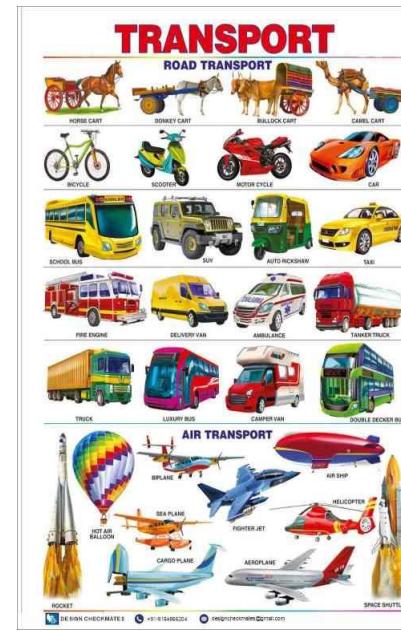
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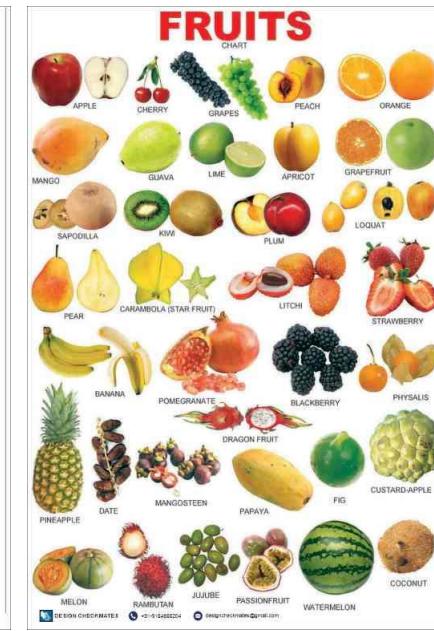
DC-G-05



DC-G-06



DC-G-07



DC-G-08



DC-G-09



DC-G-10



DC-H-01

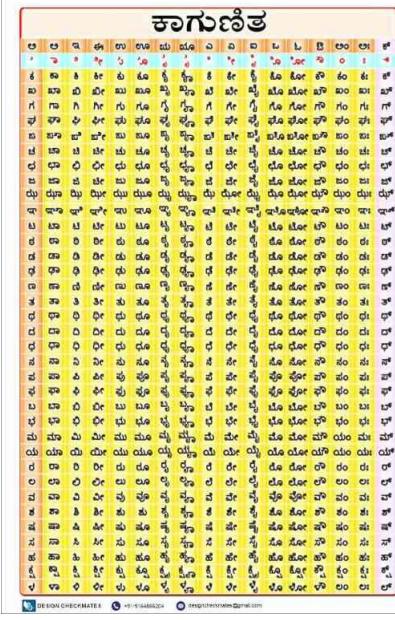
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2	2	4	6	8	10	12	14	16
3	3	6	9	12	15	18	21	24
4	4	8	12	16	20	24	28	32
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6	6	12	18	24	30	36	42	48
7	7	14	21	28	35	42	49	56
8	8	16	24	32	40	48	56	64
9	9	18	27	36	45	54	63	72
10	10	20	30	40	50	60	70	80
11	11	22	33	44	55	66	77	88
12	12	24	36	48	60	72	84	96
13	13	26	39	52	65	78	91	104
14	14	28	42	56	70	84	98	112
15	15	30	45	60	75	90	105	120
16	16	32	48	64	80	96	112	128
17	17	34	51	68	85	102	119	136
18	18	36	54	72	90	108	126	144
19	19	38	57	76	95	114	133	152
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21	21	42	63	84	105	126	147	168
22	22	44	66	88	110	132	154	176
23	23	46	69	91	113	135	157	179
24	24	48	72	96	120	144	168	192
25	25	50	75	100	125	150	175	200
26	26	52	78	104	130	156	182	208
27	27	54	81	108	135	162	189	216
28	28	56	84	112	140	168	196	224
29	29	58	87	117	146	175	204	233
30	30	60	90	120	150	180	210	240
31	31	62	93	124	155	186	217	248
32	32	64	96	128	160	192	224	256
33	33	66	99	132	165	198	231	264
34	34	68	102	136	170	204	238	272
35	35	70	105	140	175	210	245	280
36	36	72	108	144	180	216	252	288
37	37	74	111	147	184	221	258	295
38	38	76	114	151	188	225	262	300
39	39	78	117	154	191	228	265	303
40	40	80	120	160	200	240	280	320
41	41	82	122	162	202	242	282	322
42	42	84	124	164	204	244	284	324
43	43	86	126	166	206	246	286	326
44	44	88	128	168	208	248	288	328
45	45	90	130	170	210	250	290	330
46	46	92	132	172	212	252	292	332
47	47	94	134	174	214	254	294	334
48	48	96	136	176	216	256	296	336
49	49	98	138	178	218	258	298	338
50	50	100	140	180	220	260	300	340
51	51	102	142	182	222	262	302	342
52	52	104	144	184	224	264	304	344
53	53	106	146	186	226	266	306	346
54	54	108	148	188	228	268	308	348
55	55	110	150	190	230	270	310	350
56	56	112	152	192	232	272	312	352
57	57	114	154	194	234	274	314	354
58	58	116	156	196	236	276	316	356
59	59	118	158	198	238	278	318	358
60	60	120	160	200	240	280	320	360
61	61	122	162	202	242	282	322	362
62	62	124	164	204	244	284	324	364
63	63	126	166	206	246	286	326	366
64	64	128	168	208	248	288	328	368
65	65	130	170	210	250	290	330	370
66	66	132	172	212	252	292	332	372
67	67	134	174	214	254	294	334	374
68	68	136	176	216	256	296	336	376
69	69	138	178	218	258	298	338	378
70	70	140	180	220	260	300	340	380
71	71	142	182	222	262	302	342	382
72	72	144	184	224	264	304	344	384
73	73	146	186	226	266	306	346	386
74	74	148	188	228	268	308	348	388
75	75	150	190	230	270	310	350	390
76	76	152	192	232	272	312	352	392
77	77	154	194	234	274	314	354	394
78	78	156	196	236	276	316	356	396
79	79	158	198	238	278	318	358	398
80	80	160	200	240	280	320	360	400
81	81	162	202	242	282	322	362	402
82	82	164	204	244	284	324	364	404
83	83	166	206	246	286	326	366	406
84	84	168	208	248	288	328	368	408
85	85	170	210	250	290	330	370	410
86	86	172	212	252	292	332	372	412
87	87	174	214	254	294	334	374	414
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89	89	178	218	258	298	338	378	418
90	90	180	220	260	300	340	380	420
91	91	182	222	262	302	342	382	422
92	92	184	224	264	304	344	384	424
93	93	186	226	266	306	346	386	426
94	94	188	228	268	308	348	388	428
95	95	190	230	270	310	350	390	430
96	96	192	232	272	312	352	392	432
97	97	194	234	274	314	354	394	434
98	98	196	236	276	316	356	396	436
99	99	198	238	278	318	358	398	438
100	100	200	240	280	320	360	400	440

DC-H-02

DC-H-01



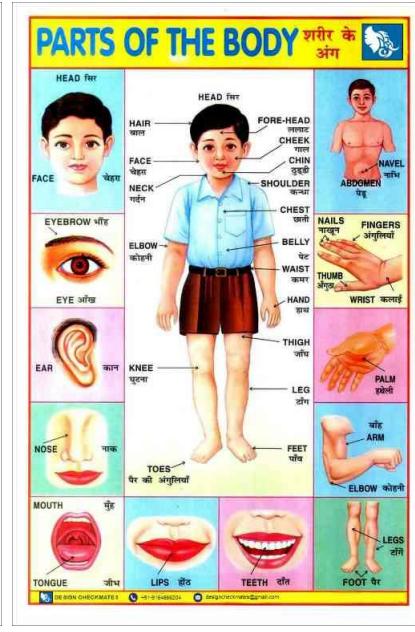
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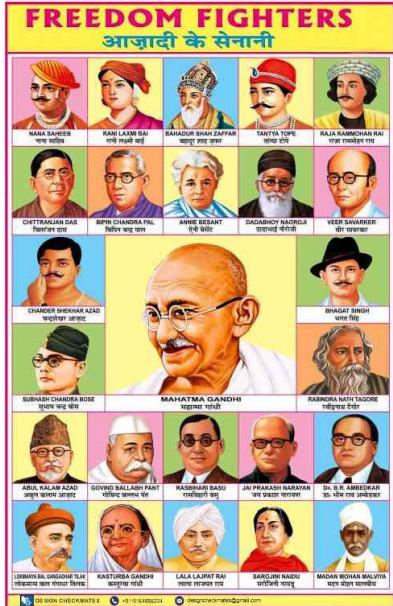
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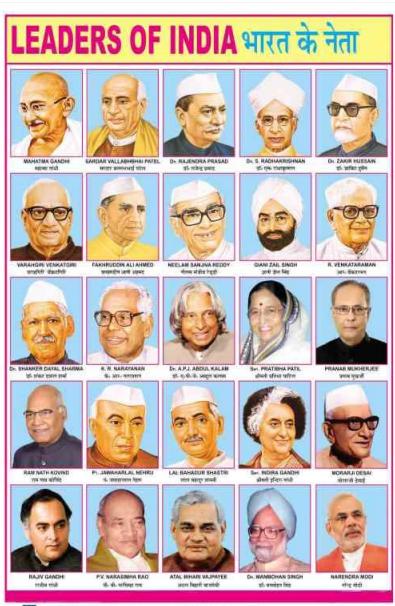
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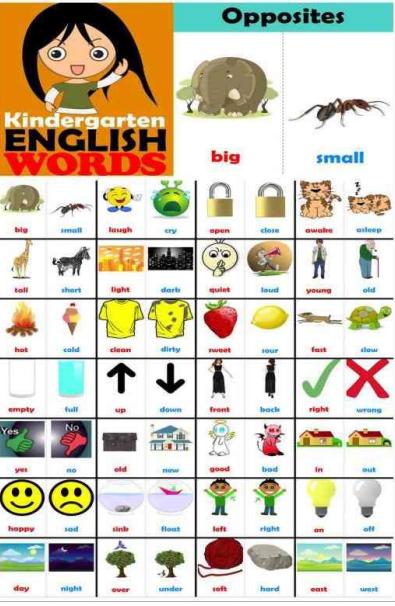
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DC-H-07



DC-H-08



DC-H-09



DC-H-10

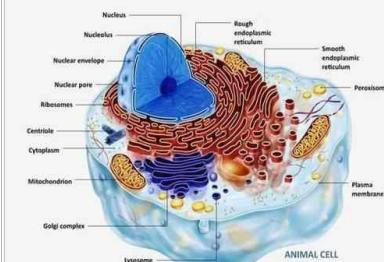
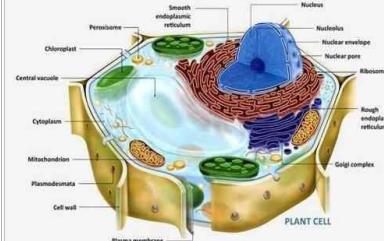
Days of the Week

SUNDAY
MONDAY
TUESDAY
WEDNESDAY
THURSDAY
FRIDAY
SATURDAY

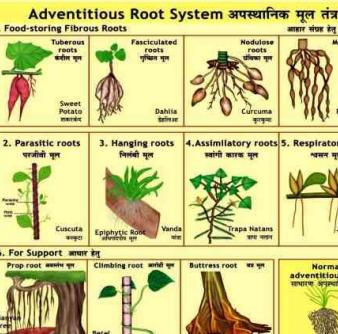
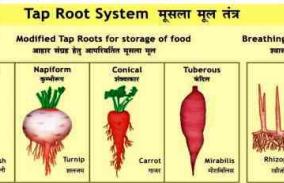
Physical Units

Quantity	Name	Symbol
Energy	joule	J
Moment	newton meter	N·m
Speed	meter per second	m/s
Time	second	s
Weight	newton	N
Area	square meter	m ²
Length	meter	m
Mass	kilogram	kg
Volume	cubic meter	m ³
Density	kilogram per cubic meter	kg/m ³
Force	newton	N
Pressure	pascal	Pa
Current	ampere	A
Potential Difference	volt	V
Resistance	ohm	Ω
Temperature	degree Celsius	°C

Plant and Animal Cells



Kinds of Roots विभिन्न प्रकार के मूल



DC-H-11

DC-H-12

DC-H-13

DC-H01-01

LATHE OPERATION

For performing the various machining operations in a lathe, the job is being supported and driven by anyone of the following methods:

- Job is held by hand with the other end supported on the tail stock center.
- Job is held between centers and driven by a chuck or a faceplate or an angle plate.
- Job is held on mandrel, which supports between centers and driven by a chuck and driven on catch plates.

The above methods for holding the job can be classified under two headings: centre and work piece.

The operations performed in lathe can be understood by three major categories:

- 1. Turning
- 2. Drilling
- 3. Boring

Welding

Welding is the process of joining similar metals by the application of heat, with or without application of pressure or filler metal, in such a way that the joint is equivalent in composition and characteristics of the metals. At the beginning, welding was mainly used for repairing all kinds of worn-out parts. Now, it is widely used in manufacturing industry, construction industry/construction of ships, tanks, locomotives and automobiles) and maintenance work, replacing riveting and bolting, to a greater extent.

The various welding processes are:

1. Gas welding.
2. Gas welding.
3. Thermal welding.
4. Electrical resistance welding and
5. Electrode welding.

» **Electric arc welding**

Arc welding is the welding process, in which heat is generated by an electric arc struck between an electrode and the work piece. Electric arc is luminous electrical discharge between two electrodes through heated gas.

» Any arc welding method is based on an electric circuit consisting of the following parts:

- a. Power supply (AC or DC).
- b. Electrode holder.
- c. Work piece.
- d. Welding leads (electric cables) connecting the power source and work piece to the power supply.

» **Electrodes**

Filler rods are used in arc welding called electrodes. These are made of metallic wire called core wire, having appropriate coating. These are also made of coated electrodes. These are coated with a suitable metal oxide, mainly zinc oxide. This is done to prevent the weld from oxidizing. The length of the electrode is about 20mm of length is left at one end for holding with the electrode holder. It helps in transmitting full current from electrode holder to the front end of the electrode coating. Flux acts as an insulator of electricity. In general, electrodes are classified into five main groups: mild steel, carbon steel, special alloy steel, cast iron and non-ferrous.

» **Welding Tools**

Electrode holder, Wire brush, Chipping hammer, Hand gloves, Face shield, Ground clamp.

FIG : A

FIG : B

FIG : C

WELDING

Welding is the process of joining similar metals by the application of heat, with or without application of pressure or filler metal, in such a way that the joint is equivalent in composition and characteristics of the metals. At the beginning, welding was mainly used for repairing all kinds of worn-out parts. Now, it is widely used in manufacturing industry, construction industry/construction of ships, tanks, locomotives and automobiles) and maintenance work, replacing riveting and bolting, to a greater extent.

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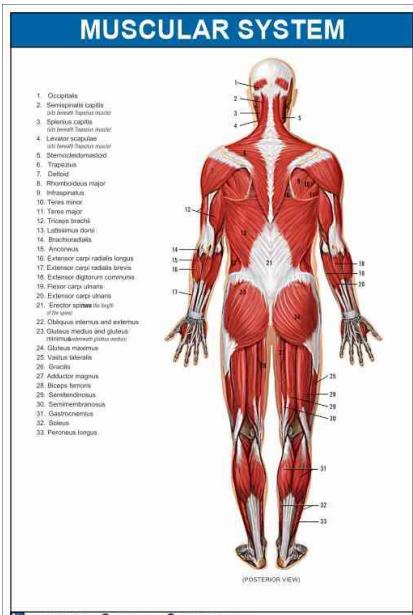
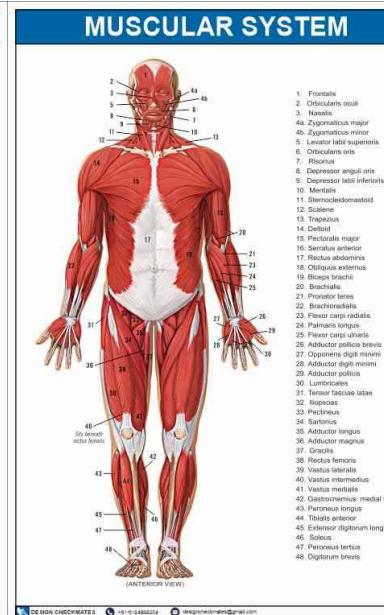
- a. Power supply (AC or DC).
- b. Electrode holder.
- c. Work piece.
- d. Welding leads (electric cables) connecting the power source and work piece to the power supply.

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» **Welding Tools**

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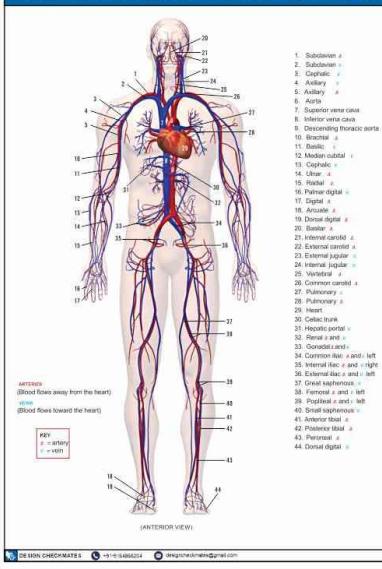
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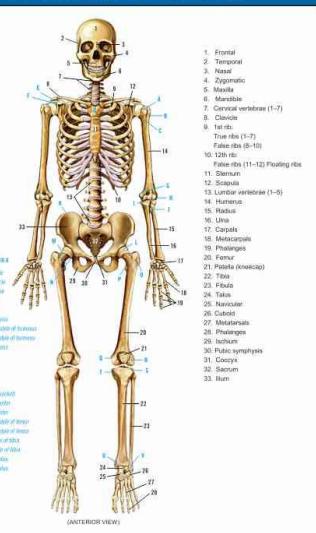
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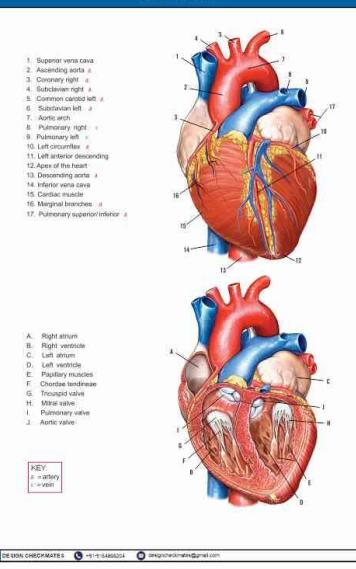
GENERAL VASCULAR SYSTEM



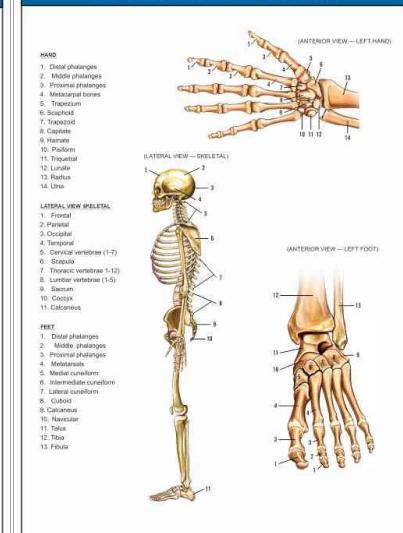
SKELETAL SYSTEM



HEART



SKELETAL SYSTEM



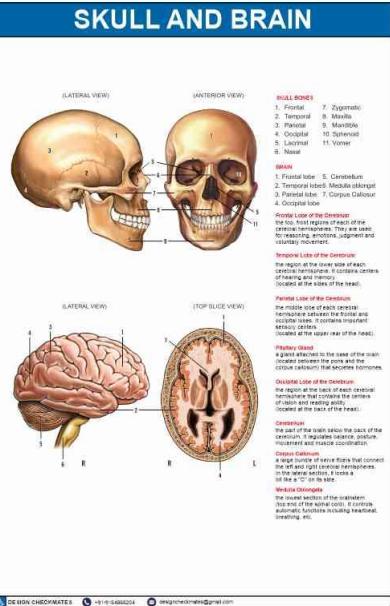
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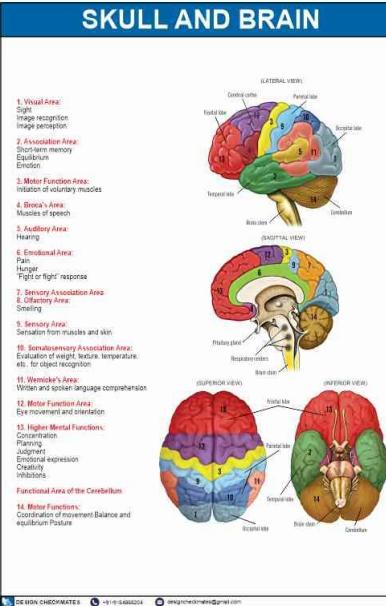
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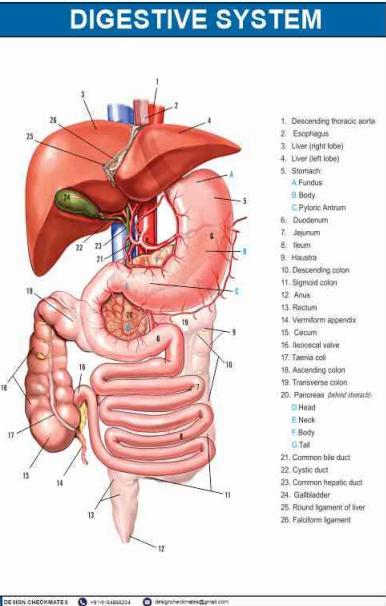
SKULL AND BRAIN



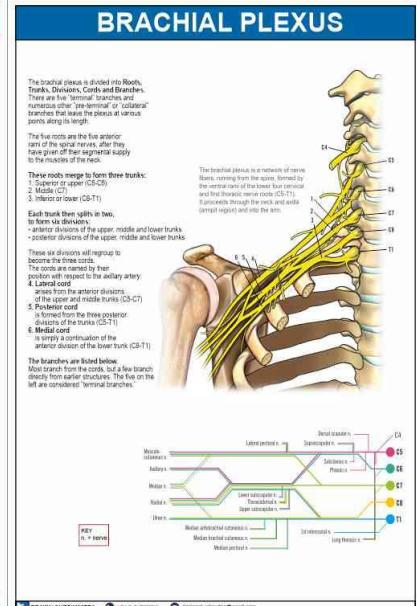
SKULL AND BRAIN



DIGESTIVE SYSTEM



BRACHIAL PLEXUS

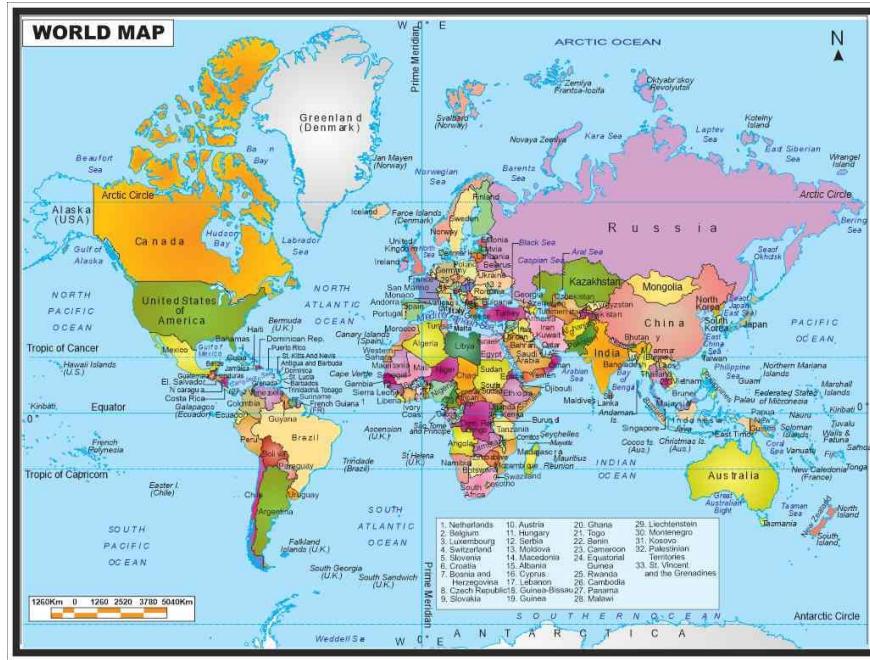


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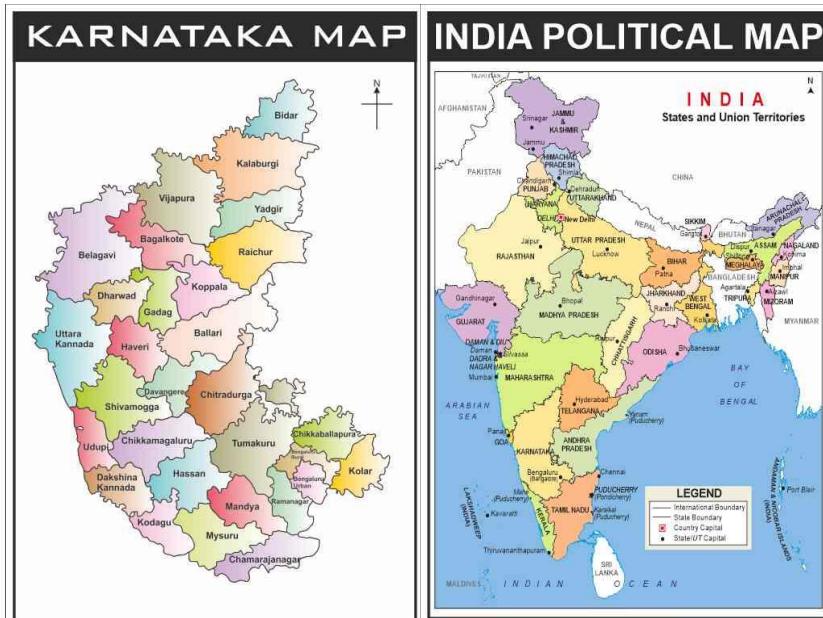
DC-H06-02

DC-H07-01

DC-H07-02



DC-H08-03



DC-H08-02

DC-H08-01