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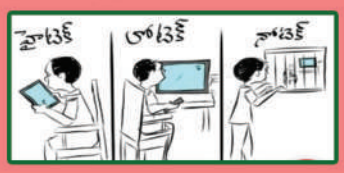

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5. Key points విద్యార్థి యొక్క విషయ సంగ్రహణకు అత్యుత్తమ Tools గా ఉపకరిస్తాయి.
6. అవసరమైన మేరకు bits 100 నుంచి 150 వరకు సిద్ధం చేయడం జరిగింది. QR ద్వారా వీడియోలో bits చూడవచ్చు.
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8. శ్రీ పురుషోత్తంగారు M.Sc, (Bot), M.Sc.(Zoo) ; B.Ed., మరియు Bharathi.B.Sc., B.Ed.గారు ఇద్దరు Corona Time నుఉపయోగించి student కి easy గా ఉండే విధంగా Biology Notes ను (EM & TM) తయారు చేయడం జరిగింది.
9. **THINKING SKILLS, OBJECTIVE TYPE (1 to 12 type and Additional Bits)**

1) Sequential Order 2) Flow charts & Graphs 3) Give Examples 4) Find the error and Rewrite it 5) Slogans 6,7) Answer the Questions with the Help of Paragraph 8) Observe the Diagram, Identify the Parts 9) Who am I ? 10) Abbreviations 11) Scientists and Inventions. 12) Identify the Mismatched one 13) "Questionnaire" to know about 14) Following habits / Precautions / Giving suggestions 15) Diagrams and Parts & Synopsis : -QR Scan ద్వారా Video రూపములో Simple గా బొమ్మ వేసే విధానం కలదు. దాని గురించి వివరణ కలదు. ఈ విధంగా Text Book నందు ఉన్న అన్ని images నేర్చుకొనవచ్చును.

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DIAGRAM BASED QUESTIONS :- పై Items సక్రమంగా అర్థం చేసుకొన్నట్లు అయితే Diagram Based Questions కు Exam నందు Answers easy గా చెయ్యగలరు.

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23-11-2020 నుండి అన్ని **Subjects (E.M. & T.M)** అందుబాటులో ఉండును. మీకు దగ్గరలో ఉన్న **Book Shop** లో అడగండి, లేకపోతే నన్ను సంప్రదించండి. నేను **Dispatch** చేయగలను. **Books** తీసుకున్న తర్వాత **amount** ఇవ్వవచ్చు. **A.P. Govt.** 30-10-2020న విడుదల చేసిన 2020-21 **వార్షిక విద్యా ప్రణాళిక** కూడా పుస్తకము నందు **add** చేయబడినది.

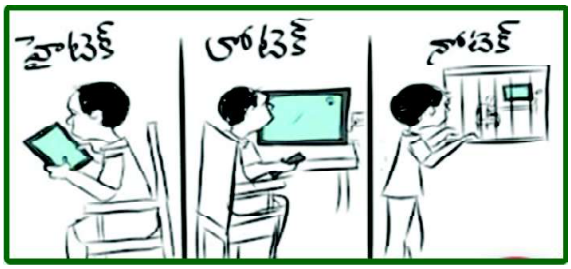
తరగతి గదిలో చేయవలసిన కృత్యాలు	ఇంటి వద్ద చేయవలసిన కృత్యాలు	ఐచ్ఛికంగా చేయదగిన కృత్యాలు

ఇవన్నీ ఏమిటో తెలుసుకొని నాయొక్క **notes** ను ఫాలో అయినట్లయితే, **Single paper** పరీక్షలు పెట్టినా, **Two papers** పరీక్షలు పెట్టినా ఈ నోట్స్ బాగా ఉపయోగించుకోవచ్చు. తరువాత **Govt. release** చేసే **Model paper** ప్రకారం **4 model papers with answers** మేము తయారుచేస్తాము. **New model paper each subject** రూ. 25/- ఉండవచ్చు. ముందు **subject** చదివిన తరువాత **Model paper** చేసుకొనవచ్చు. త్వరలో విడుదలయ్యే **Model papers** పుస్తకం మీద ఉన్న **QR** నందు **Free** గా **Insert** చేయబడును.

ఈ **PDF Sample** మాత్రమే. **Book** మొత్తం **Pages Index** నందు చూడవచ్చు. ఈ **PDF file** పుస్తకం ఏ విధంగా ఉంటుందో అనే అవగాహన కల్పించడానికి అక్కడక్కడ కొన్ని పేజీలు **cut** చేసి ఇవ్వడం అయినది. ఈ **PDF file Xerox** తీయించుకుంటే **matter continue** గా ఉండదు.

<u>మా నోట్స్ ఈ విధంగా వాడవచ్చు.</u>

1) విద్యార్థి ఇంటి వద్ద ఉన్నా చదువుకొనవచ్చు మరియు **QR scan** ద్వారా వీడియోలు చూడవచ్చు.
2) విద్యార్థి వద్ద ఈ **Book** మరియు **Text Book** మరియు **Teacher** చెప్పేది వింటే చాలు. ఇంకా ఎందుకు ?
3) **School Projector** ద్వారా, ఇంటిలో ఉండి మొబైల్ ద్వారా వీడియోలను **QR scan** ద్వారా చూడవచ్చు.
4) పుస్తకము నందు పెట్టిన **QR**ను **scan** చేసినట్లయితే **online exams, school projector** ద్వారా కానీ, మొబైల్ ద్వారా **exam** వ్రాయవచ్చు.



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ONLINE AND OFFLINE PRINTED BOOKS (WITH QR TECHNOLOGY) (ONLY 10TH CLASS) (EM & TM) ALL SUBJECTS

2020-21 వార్షిక ప్రణాళిక ప్రకారం తయారు చెయ్యబడిన 10వ తరగతి నోట్స్‌లు

తెలుగు మీడియం అండ్ ఇంగ్లీషు మీడియం బుక్స్ (All subjects) లభించును. మా వద్ద వాటి వివరాలు

తెలుగు నోట్స్ (PSR DIGITAL BOOKS)

2020-21 విద్యా సంవత్సరానికి సంబంధించి ఆంధ్రప్రదేశ్ రాష్ట్రప్రభుత్వం 10వ తరగతి వార్షికా ప్రణాళిక విడుదల చేశారు. దీన్ని అనుసరించి మా ప్రచురణలో క్రొత్త వార్షిక ప్రణాళిక నకలుతో పాటు పాఠ్యాంశాలకు సంబంధించిన కవికాలాదులు, పాఠ్యనేపథ్యాలు, సారాంశాలు, * గుర్తులు గల పద్యాలు, భావాలు, ప్రతి పదార్థాలు, లఘుప్రశ్నలు, వ్యాసరూపప్రశ్నలు, ఎంత వరకు అవసరమో అంతవరకు విపులంగా ఇవ్వబడ్డాయి. అలాగే వ్యాకరణానికి సంబంధించి సుమారు ముప్పై అంశాలపై విడివిడిగా వివరణ మరియు అభ్యాసాలు ఇవ్వడం జరిగింది. ప్రతి వ్యాకరణ అంశం యొక్క శీర్షిక వద్ద QR code ల ద్వారా ఆయా వ్యాకరణాంశాలు దృశ్య, శ్రవణ, మాధ్యమంలో కలిగి ఉంటాయి. ఇక ఉపవాచకంకి సంబంధించి రామాయణంపై వచ్చే అన్ని రకాల ప్రశ్నలు జవాబులు ఇవ్వబడ్డాయి. వీటికి కూడా దృశ్య, శ్రవణ, మాధ్యమంలో QR codes ద్వారా వీడియోలు చూడవచ్చు. అలాగే self assessment కొరకు online tests కూడా QR codes scan చేయటం ద్వారా Online Exam రూపంలో ఇవ్వబడ్డాయి. ఈ విధంగా ప్రత్యేక అంశాలు కలిగిన ఈ పుస్తకం సహాయంతో విద్యార్థులు తక్కువ సమయంలో ఎక్కువ అభ్యసించి మంచి మార్కులు/ గ్రేడు సాధిస్తారని నా విశ్వాసం.

ENGLISH NOTES (PSR DIGITAL BOOKS)

As per the new academic year plan, 2020-21 for 10th class, given by the Government of Andhra Pradesh, we have come up with a simple but comprehensive material for third language English, A copy of new and revised year plan which excludes 4th unit (Films and Theatres) has been inserted. This book has been prepared by expert teachers to cater to the needs of all kinds of students of 10th class. This book includes summaries for all ABC readings of 5 units of revised syllabus and year plan, comprehension pasages with answers, and nearly 45 grammar topics with number of examples on each topic. This book also comprises exercises on creative writing skills. The QR code that contain video lessons and self - assessment online tests by the best teachers across the state given at each topic, will help the students to learn things in an innovative way. Hope this book will help the students immensely to overcome the fear of English and get good marks.

HINDI NOTES (PSR DIGITAL BOOKS)

ఆంధ్రప్రదేశ్ ప్రభుత్వం 2020-21 విద్యా సంవత్సరం ననుసరించి 10వ తరగతి ద్వితీయ భాష హిందీ పాఠ్య ప్రణాళిక ననుసరించి ఈ మెటీరియల్ 2020-21సంవత్సరమునకు సిద్ధం చేయడం జరిగింది. ఈ విద్యాసంవత్సరంలో విద్యార్థులు ఎదుర్కొన్న ప్రతికూల పరిస్థితులను దృష్టిలో పెట్టుకుని అవసరమైన అన్ని విషయాలను కూర్చి అత్యంత అనుభవజ్ఞులైన ఉపాధ్యాయులచే, అత్యంత సరళంగా ఈ పుస్తకం సిద్ధం చేయబడింది. కవికాలాదులు, సారాంశాలు, ప్రశ్న-జవాబులు మరియు వ్యాకరణాంశాలు అనేక ఉదాహరణలతో విపులంగా ఇవ్వబడ్డాయి. Letter writing, eassy writing లాంటి విషయాలు సులభమైన శైలిలో ఇవ్వబడ్డాయి. ప్రతిపాఠానికి సంబంధించిన audio-visual methods of learning కొరకు QR codes ఏర్పాటువుంది. అలాగే self assessment కొరకు online tests కూడా QR codes రూపంలో ఇవ్వబడ్డాయి. C.D గ్రేడులకు తక్కువ సైజు Material విడిగా ఇవ్వబడినది. ఈ పుస్తకం తక్కువ సమయంలో ఎక్కువ నేర్చుకునేందుకు ఉపయోగపడి విద్యార్థులు మంచి మార్కులు సాధిస్తారని నా విశ్వాసం.

MATHEMATICS NOTES (గణిత శాస్త్రం నోట్స్) : (EM &TM)(PSR DIGITAL BOOKS)

ఆంధ్రప్రదేశ్ రాష్ట్ర ప్రభుత్వం 2020-21 విద్యాసంవత్సరానికి 10వ తరగతి గణితశాస్త్రంలో కొన్ని Paper-I & Paper -II మరియు ఐచ్చికంగా ఉన్న Chapters ప్రకారం వార్షిక ప్రణాళికను ఇచ్చింది. Year plan ను అనుసరించి ఒక వినూత్న రీతిలో మేము material సిద్ధం చేశాం. ప్రతి chapter కు సంబంధించిన formulas, Key points, 1/2 మార్క్, 1 Mark bits విడివిడిగా ఇవ్వబడ్డాయి.

రాష్ట్ర స్థాయిలో అత్యుత్తమ ఉపాధ్యాయులచే మెటీరియల్ సిద్ధం చేయించడం జరిగింది. ప్రతి chapter శీర్షిక వద్ద QR code ఇవ్వడం జరిగింది. ఈ QR codes ద్వారా teachers explain చేసిన videos ఉంటాయి. అలాగే self-assessment కోసం Online tests కూడా QR codesలో ఉన్నాయి.

కనుక విద్యార్థులు తక్కువ సమయంలో ఎక్కువ నేర్చుకుని లబ్ధిపొందాలని మా ఆకాంక్ష .

PHYSICS SCIENCE NOTES (భౌతిక రసాయన శాస్త్రం నోట్స్) (EM &TM)(PSR DIGITAL BOOKS)

2020-21 విద్యాసంవత్సరానికి ఆంధ్రప్రదేశ్ రాష్ట్ర ప్రభుత్వం 10వ తరగతి భౌతిక రసాయన శాస్త్రం యొక్క నూతన వార్షిక ప్రణాళికను ఇవ్వడం జరిగింది. ఈ ప్రణాళికననుసరించి మేము ఒక వినూత్న రీతిలో material సిద్ధం చేశాం. Formulas, diagrams, very short answerquestions etc., చాలా విపులంగా మరియు తక్కువ సమయంలో ఎక్కువ నేర్చుకునే విధంగా ఈ పుస్తకాన్ని సిద్ధం చేయించడం జరిగింది. రాష్ట్రంలో గల అత్యుత్తమ భౌతిక రసాయన టీచర్లు తయారు చేసిన వీడియోలు Scan చేయటం ద్వారా Vissible గా వీడియోలు చూడవచ్చు. అలాగే self - assessment కొరకు online tests కూడా QR codes రూపంలో ఇవ్వబడ్డాయి. కనుక size లో చిన్నదైనా ప్రయోజనంలో పెద్దదైన ఈ పుస్తకాన్ని విద్యార్థులు వినియోగించుకుని లబ్ధిపొందాలని మా ఆకాంక్ష .

BIOLOGY NOTES (జీవశాస్త్రం నోట్స్)(EM &TM)(PSR DIGITAL BOOKS)

2020-21 విద్యాసంవత్సరానికి ఆంధ్రప్రదేశ్ రాష్ట్ర ప్రభుత్వం 10వ వతరగతి జీవశాస్త్రం యొక్క నూతన వార్షిక ప్రణాళికను ఇవ్వడం జరిగింది. ఈ ప్రణాళిక ననుసరించి మేము ఒక వినూత్న రీతిలో material సిద్ధం చేశాం. concept based విధానంలో notes, key points, diagrams, very short answer qeustions, చేతితో వేసిన రేఖా చిత్రాలతో పాటు 3D చిత్రాలను ఆకర్షణీయంగా ఇవ్వబడ్డాయి. తక్కువ సమయంలో ఎక్కువ నేర్చుకునే విధంగా ఈ పుస్తకాన్ని సిద్ధం చేయించడం జరిగింది. పైగా ప్రతి chapter heading దగ్గర రాష్ట్రంలో గల అత్యుత్తమ biology టీచర్ల teaching videos QR codes రూపంలో ఇవ్వబడ్డాయి. అలాగే self-assessment కొరకు online tests QR codes రూపంలో ఇవ్వబడ్డాయి. కనుక size లో చిన్నదైనా ప్రయోజనంలో పెద్దదైన ఈ పుస్తకాన్ని విద్యార్థులు వినియోగించుకుని మంచి మార్కులు/ గ్రేడులు సాధిస్తారని ఆశిస్తున్నాము.

SOCIAL STUDIES NOTES (సాంఘిక శాస్త్రం నోట్సు) (EM &TM)(PSR DIGITAL BOOKS)

ఆంధ్రప్రదేశ్ రాష్ట్ర ప్రభుత్వం 2020-21 విద్యాసంవత్సరానికి 10వ తరగతి సాంఘిక శాస్త్రం యొక్క నూతన వార్షిక విద్యా ప్రణాళికను ఇవ్వడం జరిగింది. ఈ ప్రణాళికననుసరించి మేము ఒక వినూత్న రీతిలో material సిద్ధం చేశాం 1,2,4 Marks Question & Answers simple language లో ఇవ్వడమైనది. important years, important persons and their brief histories, slogans and map pointing etc., చాలా విపులంగా మరియు తక్కువ సమయంలో ఎక్కువ నేర్చుకునే విధంగా ఈ పుస్తకాన్ని సిద్ధం చేయించడం జరిగింది. గుర్తుపెట్టిన మ్యాపు ప్రక్కనే ఖాళీ మ్యాపు ఇవ్వబడినది. QRను scan చేసినట్లు అయితే మ్యాపు గుర్తించే వీడియో కలదు. పైగా ప్రతి chapter heading దగ్గర రాష్ట్రంలో గల అత్యుత్తమ social studies టీచర్ల teaching videos QR codes రూపంలో ఇవ్వబడ్డాయి. అలాగే self assessment కొరకు online tests కూడా QR codes రూపంలో ఇవ్వబడ్డాయి. కనుక size లో చిన్నదైనా ప్రయోజనంలో పెద్దదైన ఈ పుస్తకాన్ని విద్యార్థులు వినియోగించుకుని లబ్ధిపొందాలని మా ఆకాంక్ష.

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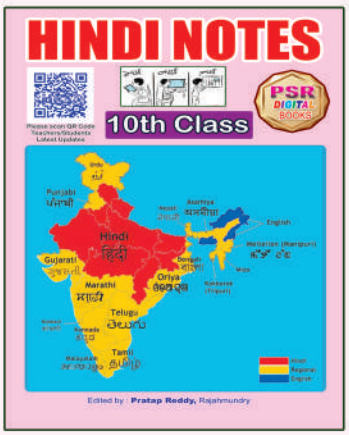
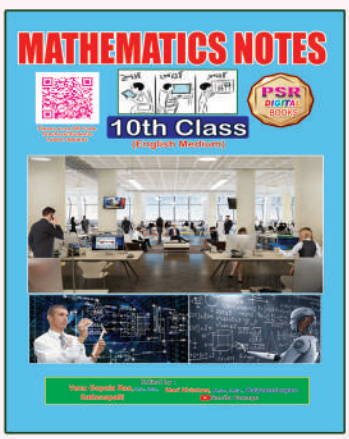
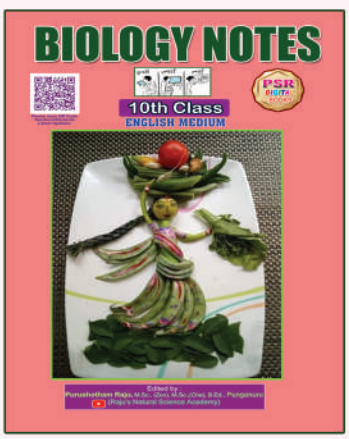
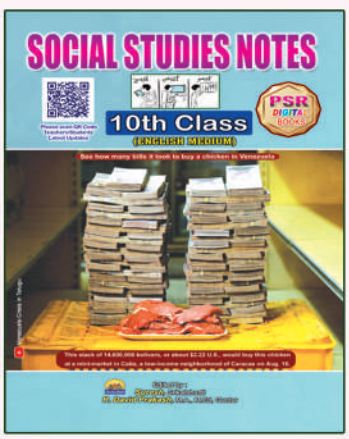
10వ తరగతి Language పుస్తకాలు



10వ తరగతి English Medium పుస్తకాలు







10వ తరగతి తెలుగు మీడియం పుస్తకాలు

TEACHER AND STUDENT PUBLICATIONS
PSR DIGITAL BOOKS (A.P. First QR Code Notes)
BIOLOGY NOTES (10TH CLASS)

సూచన :– Bookలోపల పెట్టిన QRలు scanచేసినట్లయితే Teacher/Student Conceptకు సంబంధించిన వీడియోలు చూడగలరు. QRను scan ద్వారా school projector ద్వారా కూడా వీడియోలు చూడగలరు.

By
POTTI SAMBASIVA RAO, M.A.,T.T.C.
PSR Digital Books

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విషయం : జీవశాస్త్రం

వారం/విషయము	అభ్యసన ఫలితాలు	వనరులు	తరగతి గదిలో చేయవలసిన కృత్యాలు	ఇంటి పని / విద్యార్థి కృత్యాలు	ఐచ్ఛికంగా చేయదగిన కృత్యాలు
వారం - 1 **పోషణ** **స్వయం పోషణ**	విద్యార్థి 1. కిరణజన్య సంయోగక్రియకు అవసరమైన కారకాలు మరియు ఉత్పత్తులను గుర్తించును 2. కిరణజన్య సంయోగక్రియ సమీకరణంను వ్రాయును. 3. కిరణజన్య సంయోగక్రియ జరుగకపోతే జరిగే పరిణామాలను ఊహించును. 4. మొక్కలకు కార్బన్‌డైఆక్సైడ్ లభించకపోతే ఏమవుతుందో విచారణ జరుపును. 5. హరిత రేణువు పట్టము గీచి భాగాలు గుర్తించును. 6. ఆకుపచ్చని మొక్కలు ఆహారం తయారు చేసుకునే విధానాన్ని ప్రశంసించును.	1. ఎ.పి. యస్.సి.ఇ.ఆర్.టి. పాఠ్య పుస్తకం. 2. యస్.సి.ఇ.ఆర్.టి. పాఠ్యపుస్తకం 3. దీక్ష ఇ-కంటెంట్ 4. డిడి సప్తగిరి విద్యావారధి వీడియోలు: 5. కిరణజన్య సంయోగ క్రియా విధానాన్ని చూపే వీడియో	1. కిరణజన్య సంయోగక్రియా చర్చ 2. కిరణజన్య సంయోగక్రియలో కార్బన్‌డై ఆక్సైడ్ అవసరం.(పేజి. 6) 3. ప్రయోగశాల కృత్యం: కాంతి సమక్షంలో కిరణజన్య సంయోగక్రియలో ఆక్సిజన్ విడుదల (పేజి.8) 4. హరితరేణువు నిర్మాణం చర్చ (పేజి.10) 5. కిరణజన్య సంయోగక్రియ జరిగే విధానం-చర్చ (పేజి.11,12)	1. వివిధ రకాల పోషణ విధానాలను అధ్యయనం చేయుట (పేజినెం.01)	1. కృత్యం.1 పత్రంలో పిండి పదార్థ పరీక్ష (పేజినెం.3,4) 2. కిరణజన్య సంయోగ క్రియలో వివిధశాస్త్రవేత్తల కృషిని అర్థంచేసుకొనుట 3. కృత్యం.3 పిండిపదార్థం ఏర్పడడానికి కాంతి ఆవశ్యకత (పేజినెం.8,9)

A.P. Government 2020-2021 y•|¿ $<'« ¦|D²|¿
10th Class JeX#d+

విషయం : జీవశాస్త్రం

వారం/విషయము	అభ్యసన ఫలితాలు	వనరులు	తరగతి గదిలో చేయవలసిన కృత్యాలు	ఇంటి పని / విద్యార్థి కృత్యాలు	ఐచ్ఛికంగా చేయదగిన కృత్యాలు
వారం - 2 **పరపోషణ విధానం**	విద్యార్థి 1. వివిధ పరపోషణ విధానాలను వివరించును. 2. వివిధ రకాల పోషణ విధానంకు ఉదాహరణలిచ్చును. 3. పోషకాహార లోపంకు గల కారణాలు తెల్పును 4. మానవజీర్ణ క్రియా విధానంను వివరిస్తాడు. 5. మానవ జీర్ణవ్యవస్థ పటంగీచి భాగాలు గుర్తించును: 6. పోషకాహార లోపం కారణాలు గురించి తెలునుకోవడానికి అన్వేషణలు చేయును. 7. ఆరోగ్యం ను కాపాడంలో విటమిన్ల ఆవశ్యకతను ప్రశంసించును.	1. ఎ.పి. యస్.సి.ఇ.ఆర్.టి. పాఠ్య పుస్తకం. 2. యస్.సి.ఇ.ఆర్.టి. పాఠ్యపుస్తకం 3. దీక్ష ఇ-కంటెంట్ 4. డిడి సప్తగిరి విద్యావారధి వీడియోలు: 5. మానవునిలో జీర్ణక్రియా విధానంను తెలుపు వీడియోలు:	1. మానవునిలో జీర్ణ వ్యవస్థ-చర్చ (పేజినెం.14,15) 2. పోషకాహార లోపం వ్యాధులు-చర్చ (పేజినెం.19,20)	1. జీవులు తమ ఆహారాన్ని ఎలా పొందగలుగుతాయి. (పేజినెం.13) 2. కృత్యం - 5 ఎంజైముల పట్టికను పరిశీలిద్దాం (పేజి 17)	1. కస్కూట్టాలో పరాన్న జీవ పోషణ (పేజినెం.14) 2. కృత్యం-4 పెరిస్టాలిటిక్ చలనం (పేజినెం.16) 3. ఆహార వాహికకు సంబంధించిన ఆరోగ్యకర అంశాలు (పేజినెం.18,19)

విషయం : జీవశాస్త్రం

వారం/విషయము	అభ్యసన ఫలితాలు	వనరులు	తరగతి గదిలో చేయవలసిన కృత్యాలు	ఇంటి పని / విద్యార్థి కృత్యాలు	ఐచ్ఛికంగా చేయదగిన కృత్యాలు
వారం - 3 **శ్వాస క్రియ**	విద్యార్థి 1. ఉచ్ఛ్వాస నిశ్వాసల మధ్య బేధాలు తెలుపును. 2. శ్వాసక్రియలోని వివిధ దశలను చూపే ఫ్లోచార్టును గీయును. 3. మానవునిలో శ్వాసక్రియావిధానం ను వివరించును. 4. మానవ శ్వాసవ్యవస్థ పటం గీచి భాగాలు గుర్తించును. 5. ఉదారవితానం నక్రమంగా వనిచేయకపోతే జరిగే పరిణామాలను ఊహించును. 6. నీరు, ఆహారం వాయునాళం లోనికి ప్రవేశించకుండా నిరోధించుటలో ఉపజిహ్విక యొక్క పాత్రను ప్రశంసించును. 7. ఆరోగ్యం ను కాపాడంలో విటమిన్ల అవశ్యకతను ప్రశంసించును.	1. ఎ.పి. యస్.సి.ఇ.ఆర్.టి. పాఠ్య పుస్తకం. 2. యస్.సి.ఇ.ఆర్.టి. పాఠ్యపుస్తకం 3. దీక్ష ఇ-కంటెంట్ 4. డిడి సప్తగిరి విద్యావారధి వీడియోలు: 5. మానవునిలో శ్వాసక్రియా విధానం ను చూపే వీడియో 6. ఉపజిహ్విక పనిచేయు: విధానంను చూపే వీడియో 7. ఊపిరితిత్తులు, కణజాలాలలో వాయు మార్పిడిని చూపే వీడియో	1. శ్వాసక్రియలో వివిధ దశలు - చర్చ (పేజినెం.28,29) 2. ఉపజిహ్విక-వాయు ప్రసారం-చర్చ (పేజినెం.31) 3. మానవునిలో శ్వాసక్రియా విధానం-చర్చ (పేజినెం.32,33) 4. వాయు మార్పిడి-చర్చ (పేజినెం.34) 5. వాయువుల రవాణా (పేజినెం.35)	1. వాయు ప్రసార మార్గం (పేజినెం.30) 2. కృత్యం-1 స్వయంగా ప్రయత్నించండి. (పేజినెం.32)	1. శ్వాసక్రియలో వాయువుల అవిష్కరణ (పేజినెం.26,27,28) 2. ఉచ్ఛ్వాస -నిశ్వాసాలు: (పేజినెం.29)

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విషయం : జీవశాస్త్రం

వారం/విషయము	అభ్యసన ఫలితాలు	వనరులు	తరగతి గదిలో చేయవలసిన కృత్యాలు	ఇంటి పని / విద్యార్థి కృత్యాలు	ఐచ్ఛికంగా చేయదగిన కృత్యాలు
వారం - 4 **శ్వాస క్రియ**	విద్యార్థి 1. వాయు - అవాయు: శ్వాసక్రియలు కిరణజన్య సంయోగక్రియ-శ్వాసక్రియ ల మధ్య బేధాలు తెలుపును. 2. అవాయు-వాయు శ్వాస క్రియలను గూర్చి తెలుసుకొనును. 3. ఈస్ట్‌లలో జరుగు అవాయు: శ్వాసక్రియను పరిశీలించును. 4. కణశ్వాస క్రియను వివరించును. 5. మైటోకాండ్రియా పటం గీచి భాగాలు గుర్తించును. 6. మైట్రోకాండ్రియా పటం గీచి భాగాలు గుర్తించును. 7. శక్తి విడుదలలో మైటోకాండ్రియా పాత్రను ప్రశంసించును.	1. ఎ.పి. యస్.సి.ఇ.ఆర్.టి. పాఠ్య పుస్తకం. 2. యస్.సి.ఇ.ఆర్.టి. పాఠ్యపుస్తకం 3. దీక్ష ఇ-కంటెంట్ 4. డిడి సప్తగిరి విద్యావారధి వీడియోలు:	1. కణశ్వాస క్రియ-చర్చ (పేజినెం.36,37) 2. అవాయు శ్వాసక్రియ ప్రయోగశాల కృత్యం ఈస్ట్‌తో కొన్ని ప్రయోగాలు: (పేజినెం.40,41) 3. కృత్యం-3 శ్వాసక్రియలో కార్బన్ డై ఆక్సైడ్ విడుదల (పేజినెం.45) 4. కృత్యం-4 శ్వాసక్రియలో ఉష్ణం విడుదల (పేజినెం.46)	1. మొక్కలలో శ్వాసక్రియా అంశం పఠనం పేజినెం.44,45 2. కిరణజన్య సంయోగక్రియ - శ్వాసక్రియ బేధాలు పఠనం పేజినెం.46,47	1. ఆక్సిజన్ లేకుండా శక్తి విడుదల అవుతుందా? (పేజినెం.37,38, 39) 2. కృత్యం-2 చక్కెరను మండించినపుడు ఏం జరుగుతుంది? (పేజినెం. 41,42) జీవ కణాలలో ఉ ష్ణం విడుదల (పేజినెం.42,43) 3. వాయు మార్పిడి వ్యవస్థలో జీవ పరిణామం (పేజినెం.43,44)

విషయం : జీవశాస్త్రం

వారం/విషయము	అభ్యసన ఫలితాలు	వనరులు	తరగతి గదిలో చేయవలసిన కృత్యాలు	ఇంటి పని / విద్యార్థి కృత్యాలు	ఐచ్ఛికంగా చేయదగిన కృత్యాలు
వారం - 5 ప్రసరణ	విద్యార్థి 1. నాడీస్పందన, హృదయ స్పందనల మధ్యగల సంబంధాన్ని పరిశీలించును. 2. హృదయం నిర్మాణాన్ని వివరించును. 3. ధమనులు, సిరలు మధ్య భేధాలు తెలుపును. 4. ఏకవలయ ద్వివలయ రక్త ప్రసరణ వ్యవస్థల మధ్య భేధాలు తెలుపును. 5. హార్థిక వలయంలోని వివిధ దశలను వివరించును. 6. సిరలలో కవాటాలు లేకుంటే జరిగే పరిణామాలను ఊహించును. 7. హృదయం అంతర్నిర్మాణం పటంగీచి భాగాలు గుర్తించును. 8. రక్తప్రసరణలో కవాటాల పాత్రను ప్రశంసించును.	1. ఎ.పి. యస్.సి.ఇ.ఆర్.టి. పాఠ్య పుస్తకం. 2. యస్.సి.ఇ.ఆర్.టి. పాఠ్యపుస్తకం 3. దీక్ష ఇ-కంటెంట్ 4. డిడి సప్తగిరి విద్యావారధి వీడియోలు:	1. ప్రయోగశాల కృత్యం ప్రదర్శన (పేజినెం.54, 55) 2. హృదయం అంతర్నిర్మాణం చర్చ; ప్రదర్శన (పేజినెం. 55,56,57) 3. ధమనులు, సిరలు: మరియు రక్తకేశ నాళికలు (పేజినెం. 50,51) 4. హార్థిక వలయం-చర్చ (పేజినెం.62,63) 5. ఏక వలయ, ద్వి వలయ రక్త ప్రసరణ వ్యవస్థలు - చర్చ (పేజి 63, 64)	1. కృత్యం-1,2,3 స్వయంగా ప్రయత్నించండి. (పేజినెం. 52,53,54)	1. రక్తనాళాలు: మరియు ప్రసరణలో వివిధ శాస్త్రవేత్తల ఆవిష్కరణలు: (పేజినెం.57, 58,59) 2. కృత్యం-4 ధమనులు-సిరలు పరిశీలన (పేజినెం.59)

A.P. Government 2020-2021 y•|¿ $<'« ¢|D²|¿
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విషయం : జీవశాస్త్రం

వారం/విషయము	అభ్యసన ఫలితాలు	వనరులు	తరగతి గదిలో చేయవలసిన కృత్యాలు	ఇంటి పని / విద్యార్థి కృత్యాలు	ఐచ్ఛికంగా చేయదగిన కృత్యాలు
వారం - 6 ప్రసరణ	విద్యార్థి 1. శోషరస వ్యవస్థ, ప్రసరణ వ్యవస్థ మధ్యగల సంబంధం తెలుసుకొనును 2. రక్తస్కంధనం ప్రక్రియను వివరించును. 3. కొందరిలో రక్త అలస్యంగా గడ్డ కట్టడానికి కారణాలు తెలుపును 4. మూలకేశాల ద్వారా నీటిశోషణ విధానాన్ని వివరించును. 5. అధిక రక్తపీడనంకు కారణాలు: మరియు పరిణామాలు: తెలియజేయును. 6. మూలకేశ కణాలలో కణద్రవ్యం గాఢత ఎక్కువైతే ఏమవుతుందో ఊహించును. 7. మొక్కలలో నీటిరవాణాలో వేరుపీడనం పాత్రను: పరిశీలించును. 8. రక్త స్కంధనం ఫ్లోచార్ట్‌ను: గీయును. 9. మొక్కలలో పదార్థాల రవాణాలో దారువు, పోషక కణజాలల పాత్రను ప్రశంసించును. 10. ఎడిమాను నివారించుటకు తగిన సలహాలు ఇచ్చును.	1. ఎ.పి. యస్.సి.ఇ.ఆర్.టి. పాఠ్య పుస్తకం. 2. యస్.సి.ఇ.ఆర్.టి. పాఠ్యపుస్తకం 3. దీక్ష ఇ-కంటెంట్ 4. డిడి సప్తగిరి విద్యావారధి వీడియోలు:	1. శోషరస వ్యవస్థ-చర్చ (పేజినెం.64) 2. రక్తస్కంధనం (పేజినెం.67,68) 3. నీరు ఎలా శోషించబడుతుంది. కృత్యం-5 (పేజినెం.68,69) 5. మొక్కలలో తయారైన ఆహారం రవాణా-చర్చ పేజినెం.72,73	1. రక్తపీడనం-వరనం (పేజినెం.66,67) 2. కృత్యం-6 వేరు: పీడనం-స్వయంగా ప్రయత్నించండి. పేజినెం 70	1. ప్రసరణ వ్యవస్థ పరిణామ క్రమం (పేజినెం.65,66) 2. మొక్కలలో నీరు: రవాణా అయ్యే యాంత్రికం (పేజినెం.70,71) 3. మొక్కలలో ఖనిజ లవణాల రవాణా (పేజినెం.71)

విషయం : జీవశాస్త్రం

వారం/విషయము	అభ్యసన ఫలితాలు	వనరులు	తరగతి గదిలో చేయవలసిన కృత్యాలు	ఇంటి పని / విద్యార్థి కృత్యాలు	ఐచ్ఛికంగా చేయదగిన కృత్యాలు
వారం - 7 **విసర్జన**	విద్యార్థి 1. మానవ మూత్రపిండం నిర్మాణంను వివరించును. 2. కుడి, ఎడమ మూత్రపిండం స్థానంలో గల తేడాకు కారణం తెలుపును. 3. మూత్రం ఏర్పడే విధానంను వివరించును. 4. మూత్రం గాఢతపై వ్యాసోప్రెస్సిన్ యొక్క ప్రభావంను పరికల్పన చేయును. 5. మూత్రపిండం బాహ్య అంతర నిర్మాణాలను పరిశీలించును. 6. విసర్జన వ్యవస్థ మరియు నెఫ్రాన్‌ల పటం గీచి భాగాలు గుర్తించును. 7. రక్తంను శుద్ధిచేయుడంలో మూత్రపిండాల పాత్రను ప్రశంసించును.	1. ఎ.పి. యస్.సి.ఇ.ఆర్.టి. పాఠ్య పుస్తకం. 2. యస్.సి.ఇ.ఆర్.టి. పాఠ్యపుస్తకం 3. దీక్ష ఇ-కంటెంట్ 4. డిడి సప్తగిరి విద్యావారధి వీడియోలు	మానవ విసర్జన వ్యవస్థ 1. ప్రయోగశాల కృత్యం (పేజినెం.81,82) 2. మూత్రపిండాలు, మూత్రనాళికలు, మూత్రాశయం, ప్రసేకం, మూత్ర విసర్జన-చర్చ ప్రదర్శన (పేజినెం.82,86,87) 3. మూత్రపిండం అతర్నిర్మాణం నెఫ్రాన్ నిర్మాణం-చర్చ (పేజినెం.83,84) 4. మూత్రం ఏర్పడే విధానం-చర్చ (పేజినెం.84,85)	1. పరిచయం, మానవులలో విసర్జన(పేజినెం.78,79)	1. పట్టిక-2 డిపార్ట్‌మెంట్ ఆఫ్ బయోకెమిస్ట్రీ (పేజినెం.80) 2. మూత్ర సంఘటనం (పేజినెం.87,88)

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విషయం : జీవశాస్త్రం

వారం/విషయము	అభ్యసన ఫలితాలు	వనరులు	తరగతి గదిలో చేయవలసిన కృత్యాలు	ఇంటి పని / విద్యార్థి కృత్యాలు	ఐచ్ఛికంగా చేయదగిన కృత్యాలు
వారం - 8 **విసర్జన**	విద్యార్థి 1. డయాలసిస్ చేయు విధానంను వివరించును. 2. మూత్రపిండం పనిచేయకపోవడానికి గల కారణాలు తెలుపును 3. మొక్కలలో ద్వితీయ జీవక్రియా ఉత్పన్నాల సమాచారాన్ని సేకరించును. 4. శరీరంలో వ్యర్థాలు బయటకు వంచకపోతే ఏమవుతుందో పరికల్పన చేయును. 5. ప్రకృతిలోని మొక్కలు, వాటి ద్వితీయ జీవక్రియా ఉత్పన్నాలు పరిశీలించును. 6. మూత్రపిండాలు ఆరోగ్యంగా ఉండడానికి మంచి ఆహారపు అలవాట్లు అలవర్చుకొనును. 7. ద్వితీయ జీవక్రియా ఉత్పన్నాలను వారి నిజజీవితంలో వినియోగించుకొనును.	1. ఎ.పి. యస్.సి.ఇ.ఆర్.టి. పాఠ్య పుస్తకం. 2. యస్.సి.ఇ.ఆర్.టి. పాఠ్యపుస్తకం 3. దీక్ష ఇ-కంటెంట్ 4. డిడి సప్తగిరి విద్యావారధి వీడియోలు	1. డయాలసిస్-కృత్రిమ మూత్రపిండం (పేజినెం.88) 2. మొక్కలలో విసర్జన (పేజినెం.91,92) 3. అల్కలాయిడ్‌లు 4. టానిన్‌లు, రెసిన్‌లు, లేటెక్స్, జిగుర్లు చర్చ (పేజినెం.93,94)	1. మూత్రపిండ మార్పిడి (పేజినెం.89)	1. ఇతర విసర్జక మార్గాలు (అనుబంధ విసర్జక అవయవాలు) (పేజినెం.89,90) 2. ఇతర జీవులలో విసర్జన (పేజినెం.90,91) 3. విసర్జించడం -స్పందించడం. (పేజినెం.94,95)

విషయం : జీవశాస్త్రం

వారం/విషయము	అభ్యసన ఫలితాలు	వనరులు	తరగతి గదిలో చేయవలసిన కృత్యాలు	ఇంటి పని / విద్యార్థి కృత్యాలు	ఐచ్ఛికంగా చేయదగిన కృత్యాలు
వారం - 9 **నియంత్రణ-సమన్వయ వ్యవస్థ**	విద్యార్థి 1. నాడీకణం నిర్మాణంను వివరించును. 2. ఉద్దీపనలు-ప్రతిస్పందనలు, అభివాహి, అపవాహి నాడులు, పరధీయ, కేంద్రీయ నాడీ వ్యవస్థల మధ్య భేదాలు తెలుపును. 3. ప్రతీకార చర్యలను వివరించును. 4. నాడీకణాల మధ్య సైనాప్స్ పాత్రను పరికల్పన చేయును. 5. నాడీకణం, మెదడు, ప్రతీకార చర్యల పటంగీచి భాగాలు గుర్తించుము. 6. శరీరంలో వివిధ అవయవాల మధ్య సమన్వయం చేసే నాడీవ్యవస్థను ప్రశంసించును.	1. ఎ.పి. యస్.సి.ఇ.ఆర్.టి. పాఠ్య పుస్తకం. 2. యస్.సి.ఇ.ఆర్.టి. పాఠ్యపుస్తకం 3. దీక్ష ఇ-కంటెంట్ 4. డిడి సప్తగిరి విద్యావారధి వీడియోలు	1. నాడీకణం నిర్మాణం (పేజినెం.102,103) 2. ప్రబోదన, ప్రతిస్పందన మార్గాలు (పేజినెం.104) 3. ప్రతీకార చర్యాచాపం పేజినెం.105,106 4. కేంద్రీయ నాడీవ్యవస్థ మెదడు. (పేజినెం.107, 108)	1. పరిచయం, ఉద్దీపనలకు ప్రతిస్పందన చూపడం (పేజినెం.100,101) 2. కృత్యం-1 కిందపడుతున్న కర్రను పట్టుకోవడం. (పేజినెం.191,192) 3. పరణీయ నాడీవ్యవస్థ పాఠ్యాంశం పఠనం (పేజినెం.109,110)	1. నాడీ వ్యవసస్థలో సంబంధం లేని సమస్యయం (పేజినెం.112, 113) 2. సమీకృత వ్యవస్థలు, నాడీ సమన్వయం (పేజినెం.102) 3. కృత్యం-3 మోకాలిలో జరిగే ప్రతీకార చర్య (పేజినెం.105) 4. వెన్నుపాము: పేజినె.o109 5. స్వయంచోదిత నాడీ వ్యవస్థ (పేజినెం.110,111)

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విషయం : జీవశాస్త్రం

వారం/విషయము	అభ్యసన ఫలితాలు	వనరులు	తరగతి గదిలో చేయవలసిన కృత్యాలు	ఇంటి పని / విద్యార్థి కృత్యాలు	ఐచ్ఛికంగా చేయదగిన కృత్యాలు
వారం - 10 **నియంత్రణ-సమన్వయ వ్యవస్థ**	విద్యార్థి 1. వివిధ వినాళ గ్రంధులు, వాటి స్థానాలు, స్రావాలు మరియు విధులను గుర్తించును. 2. పండ్లు త్వరగా పక్వానికి రావడం, పత్రాలు రాలిపోవడం వంటి వానికి కారణాలు తెలుపును. 3. మొక్కల్లో కాంతి అనువర్తనంను వివరించును. 4. మొక్కలలో వివిధ అనువర్తనాలను గుర్తించును. 5. శరీరంను వివిధ హార్మోనులు సమస్యయ పరిచే విధానాన్ని ప్రశంసించును.	1. ఎ.పి. యస్.సి.ఇ.ఆర్.టి. పాఠ్య పుస్తకం. 2. యస్.సి.ఇ.ఆర్.టి. పాఠ్యపుస్తకం 3. దీక్ష ఇ-కంటెంట్ 4. డిడి సప్తగిరి విద్యావారధి వీడియోలు	1. పట్టిక-2 వినాళగ్రంధులు: చర్చ (పేజినెం.114) 2. పట్టిక-3 మొక్కలలో హార్మోన్లు: పేజినెం.117 3. మొక్క కాంతి వైపు వంగుట పేజినెం.117 4. మొక్కలలో అనువర్తనాలు పేజినెం.118,119	1. కృత్యం-4 స్వయంగా చేయండి. 2. కృత్యం-5 స్వయంగా చేయండి	1. ఇన్సులిన్ కథ (పేజినెం.112) 2. ఎఫ్.డబ్ల్యు. వెంట్ ప్రయోగం. పేజినెం.117, 118

విషయం : జీవశాస్త్రం

వారం/విషయము	అభ్యసన ఫలితాలు	వనరులు	తరగతి గదిలో చేయవలసిన కృత్యాలు	ఇంటి పని / విద్యార్థి కృత్యాలు	ఐచ్ఛికంగా చేయదగిన కృత్యాలు
వారం - 11 **ప్రత్యుత్పత్తి**	విద్యార్థి 1. అలైంగిక పద్ధతులలోని వివిధ రకాలను గుర్తించును. 2. అలైంగిక ప్రత్యుత్పత్తి జరిపే జీవులకు ఉదాహరణలిచ్చును. 3. లైంగిక, అలైంగిక ప్రత్యుత్పత్తి విధానాలకు గల భేదాలను వివరించును 4. జరావాయువు గల జీవుల్లో ప్రత్యుత్పత్తిని అర్థం చేసుకొనును. 5. స్త్రీ, పురుష ప్రత్యుత్పత్తి వ్యవస్థల పటాలను గీచి భాగాలను గుర్తించును. 6. రైతులు అవలంభించదగ్గ వివిధ శాఖీయోత్పత్తి విధానాల గురించి సమాచారాన్ని సేకరించును. 7. సిద్ధబీజాలు ఏర్పడే విధానాన్ని గమనించును	1. ఎ.పి. యస్.సి.ఇ.ఆర్.టి. పాఠ్య పుస్తకం. 2. యస్.సి.ఇ.ఆర్.టి. పాఠ్యపుస్తకం 3. దీక్ష ఇ-కంటెంట్ 4. డిడి సప్తగిరి విద్యావారధి వీడియోలు:	1. అలైంగిక ప్రత్యుత్పత్తి 2. సిద్ధ బీజోత్పత్తి ప్రయోగశాల కృత్యం 3. జరావాయువు గల జీవులు మానవుల్లో లైంగిక ప్రత్యుత్పత్తి	1. శాఖీయ వ్యాప్తిలో సహజ శాఖీయ వ్యాప్తి మరియు కృత్రిమ శాఖీయ వ్యాప్తి	1. కృత్యం-1 పాలలోని బాక్టీరియా సహనివేశం ఏర్పాటు.

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విషయం : జీవశాస్త్రం

వారం/విషయము	అభ్యసన ఫలితాలు	వనరులు	తరగతి గదిలో చేయవలసిన కృత్యాలు	ఇంటి పని / విద్యార్థి కృత్యాలు	ఐచ్ఛికంగా చేయదగిన కృత్యాలు
వారం - 12 **ప్రత్యుత్పత్తి**	విద్యార్థి 1. మొక్కల్లోని లైంగిక ప్రత్యుత్పత్తి విధానాన్ని వర్ణించును. 2. నమ విభజనలోని వివిధ దశలను వివరించును. 3. నమవిభజన, క్షయికరణ విభజనల మధ్య భేదాలను గుర్తించును. 4. క్షయకరణ విభజన లేకపోతే జీవుల జీవిత చక్రాన్ని పరికల్పన చేయును. 5. వృత్తం మొలకెత్తే విధానాన్ని గమనించును. 6. జీవుల పెరుగుదల, ప్రత్యుత్పత్తి విధానాలలో నమవిభజన పాత్రను ప్రశంశించును. 7. నిజ జీవితంలో ఈ జ్ఞానాన్ని ఉపయోగించుకొనును. 8. గర్భనిరోధక పద్ధతులను సూచించును. 9. లైంగిక వ్యాధులు సంక్రమించకుండా అలాగే సామాజిక రుగ్మతలైన భ్రూణ హత్యలు, చిన్న వయస్సులోనే తల్లికావడం వంటి సమస్యల బారిన పడకుండా జాగ్రత్తలు తీసుకొనును.	1. ఎ.పి. యస్.సి.ఇ.ఆర్.టి. పాఠ్య పుస్తకం. 2. యస్.సి.ఇ.ఆర్.టి. పాఠ్యపుస్తకం 3. దీక్ష ఇ-కంటెంట్ 4. డిడి సప్తగిరి విద్యావారధి వీడియోలు:	1. అండం నిర్మాణము - చర్చిస్తారు 2. కణ చక్రం - చర్చ 3. సమవిభజనలో దశలను గమనించడం - కృత్యం 4. క్షయికరణ విభజన విధానం 5. గర్భనిరోధక పద్ధతులు - చర్చ	1. పుష్పించే మొక్కలోని లైంగిక ప్రత్యుత్పత్తి విధానాన్ని చదవడం. 2. వృత్తోత్పత్తి 3. ప్రత్యుత్పత్తి-ఆరోగ్యం 4. సామాజిక రుగ్మతలను గురించి, పెద్దలతో ఉపాధ్యాయులతో చర్చించును.	1. కృత్యం-2 పరాగరేణువులను గమనించుట 2. కణ విభజన 3. జీవ జాతి కొనసాగడానికి కణ విభజన 4. ప్రత్యుత్పత్తి విధానాల ఉపయోగం.

విషయం : జీవశాస్త్రం

వారం/విషయము	అభ్యసన ఫలితాలు	వనరులు	తరగతి గదిలో చేయవలసిన కృత్యాలు	ఇంటి పని / విద్యార్థి కృత్యాలు	ఐచ్ఛికంగా చేయదగిన కృత్యాలు
వారం – 13 **జీవక్రియలలో సమన్వయం**	విద్యార్థి 1. ఆకలి వేయడానికి గల కారనాలు తెలుపును 2. నోటిలోని వివిధ రకాల దంతాల, వాటి విధులను తెలుపును: 3. పెరిస్టాలిసిస్ చలనాలు జరిగే విధానాన్ని వివరించును. 4. జీర్ణాశయం గోడలపై శ్లేష్మం యొక్క పాత్రను వరికల్పన చేయును. 5. పిండిపదార్థం పై లాలాజలం యొక్క పాత్రను పరిశీలించును. 6. ఆహారం రుచిని తెలుస: కోవడంలో అంగిలి యొక్క పాత్రను తెలియజేయును. 7. జీర్ణాశయ గోడలపై ఆమ్లం చర్యలను నియంత్రించే శ్లేష్మం యొక్క విధిని ప్రశంసించును.	1. ఎ.పి. యస్.సి.ఇ.ఆర్.టి. పాఠ్య పుస్తకం. 2. యస్.సి.ఇ.ఆర్.టి. పాఠ్యపుస్తకం 3. దీక్ష ఇ-కంటెంట్ 4. డిడి సప్తగిరి విద్యావారధి వీడియోలు:	1. కృత్యం-7 పిండి పై లాలాజలం యొక్క చర్య (పేజినెం.160,161) 2. ఆహారవాహికలో పెరిస్టాలిటిక్ చలనం (పేజినెం.163) 3. ప్రయోగశాల కృత్యం పేజినెం. 166	1. ఆకలివేయడం. కృత్యం-1 పేజినెం. 154,155 2. కృత్యం-4 నాలుక మీద చక్కెర గుళికలు స్వయంగా చేయాలి. (పేజినెం.157,158) 3. కృత్యం-6 దంతాల అమరిక పేజినెం.159,160	1. ఆకలి ప్రచోదనాల ప్రభావం 2. రుచి మరియు వాసన పరస్పర సంబంధం (పేజినెం.155) 3. కృత్యం-2,3 (పేజినెం.156,157) 4. కృత్యం-5 చాక్‌పీస్, వెనిగర్ ప్రయోగం. 5. కృత్యం-8 పి.హెచ్.పరీక్ష (పేజినెం.161) 6. ఆహార వాహిక, జీర్ణాశయంలో ఆహార ప్రయాణం (పేజినెం.162, 167 – 169) 7. జీర్ణాశయం ఒక రుబ్బురోలు వంటిది. (పేజినెం.162,165)

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విషయం : జీవశాస్త్రం

వారం/విషయము	అభ్యసన ఫలితాలు	వనరులు	తరగతి గదిలో చేయవలసిన కృత్యాలు	ఇంటి పని / విద్యార్థి కృత్యాలు	ఐచ్ఛికంగా చేయదగిన కృత్యాలు
వారం – 14 **అనువంశకత**	విద్యార్థి 1. వైవిధ్యాలు, లక్షణాంశాలు, యుగ్మవికల్పకాలు, దృశ్యరూపం, జన్యురూపం పదాలను నిర్వచించును. 2. బహిర్గతత్వ సూత్రం, పృధక్కరణ సూత్రాలను వివరించును. 3. మెండల్ తన ప్రయోగాలకు బఠాణీ మొక్కను: ఎన్నుకోవడానికి గల కారణాలు తెల్పును. 4. తల్లిదండ్రుల లక్షణాలు: పిల్లలకు సంక్రమించడానికి గల కారణాలను పరికల్పన చేయును. 5. ఏక సంకరణం మరియు: మానవునిలో లైంగిక నిర్ధారణ శ్లోచార్టులను గీయును. 6. జన్యు లక్షణాలను కనుగొనుటలో గ్రెగర్ మెండల్ యొక్క కృషిని ప్రశంసించును.	1. ఎ.పి. యస్.సి.ఇ.ఆర్.టి. పాఠ్య పుస్తకం. 2. యస్.సి.ఇ.ఆర్.టి. పాఠ్యపుస్తకం 3. దీక్ష ఇ-కంటెంట్ 4. డిడి సప్తగిరి విద్యావారధి వీడియోలు	1. బఠాణీ మొక్కలపై గ్రెగర్ మెండల్ చేసిన ఏకసంకరణం, బహిర్గతత్వ పృధక్కరణ సూత్రాల: (పేజినెం.178 నుండి 186 వరకు) 2. మానవునిలో లైంగిక నిర్ధారణ (పేజినెం.188,189)	పరిచయం 1. కృత్యం-1,2,3 పేజినెం. 176-178 2. జనకుల నుండి సంతతికి లక్షణాల: ఎలా బహిర్గతమవుతాయి. (పేజినెం.187,188) 3. ద్విసంకర సంకరణం పేజినెం.185.	–

విషయం : జీవశాస్త్రం

వారం/విషయము	అభ్యసన ఫలితాలు	వనరులు	తరగతి గదిలో చేయవలసిన కృత్యాలు	ఇంటి పని / విద్యార్థి కృత్యాలు	ఐచ్ఛికంగా చేయదగిన కృత్యాలు
వారం - 15 **అనువంశికత**	విద్యార్థి 1. డార్విన్ ప్రకృతిపరణ సిద్ధాంతాన్ని ఉదాహరణలతో వివరించును. 2. జీవపరిణామంను అర్థం చేసుకోవడం కొరకు ఉదాహరణలను విశ్లేషించును. 3. నిర్మాణసామ్యక్రియాసామ్య అవయవాల మధ్య భేదాలు గుర్తించును. 4. అవశేషావయవాలకు ఉదాహరణలిచ్చును. 5. అర్జిత గుణాల అనువంశికత జరిగితే ప్రపంచం ఎలా ఉంటుందో వరికల్పనలు చేయును. 6. పరిణామ క్రమంను అర్థం చేసుకొనుటకు కృషి చేసిన శాస్త్రవేత్తల కృషిని అభినందించును.	1. ఎ.పి. యస్.సి.ఇ.ఆర్.టి. పాఠ్య పుస్తకం. 2. యస్.సి.ఇ.ఆర్.టి. పాఠ్యపుస్తకం 3. దీక్ష ఇ-కంటెంట్ 4. డిడి సప్తగిరి విద్యావారధి వీడియోలు:	1. లామార్క్ వాదం - చర్చ (పేజినెం.192) 2. డార్వినిజం-చర్చ (పేజినెం.193-195) 3. జీవ పరిణామం ఆధారాలు - చర్చ పేజినెం. 196 4. శిలాజాల నిదర్శనాలు: పేజినెం. 197, 198	1. కృత్యం-6 పిండోత్పత్తి శాస్త్రనిదర్శనాలు: పేజినెం. 197 2. మానవుడు నడిచే అవశేషావయవాల మ్యూజియం (పేజినెం.200)	1. కృత్యం-5 రెక్కల వురుగు జనాభాలో వైవిధ్యం పేజినెం. 189,190 2. జాతుల ఉత్పత్తి (పేజినెం.195) 3. కార్బన్ డేటింగ్ (పేజినెం.198) 4. మానవ జీవపరిణామ: క్రమం (పేజినెం. 199, 200)

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విషయం : జీవశాస్త్రం

వారం/విషయము	అభ్యసన ఫలితాలు	వనరులు	తరగతి గదిలో చేయవలసిన కృత్యాలు	ఇంటి పని / విద్యార్థి కృత్యాలు	ఐచ్ఛికంగా చేయదగిన కృత్యాలు
వారం - 16 **మన పర్యావరణం**	విద్యార్థి 1. జీవులలో శక్తి ప్రసారమార్గాన్ని వివరించును. 2. జైవిక వ్యవస్థాపనం, జైవిక వృద్ధీకరణంల ప్రభావంను విశ్లేషణ చేయును. 3. ఆవరణ వ్యవస్థలో మాంసాహారులను తీసివేస్తే ఏమవుతుందో పరికల్పనలు చేయును. 4. తన చుట్టూ ఉన్న ఆవరణ వ్యవస్థలను పరిశీలించును. 5. జీవావరణ పిరమిడ్‌ల పటాలు గీయును. 6. కాలుష్యం నుండి పర్యావరణంను కాపాడుటకు సలహాలను ఇచ్చును.	1. ఎ.పి. యస్.సి.ఇ.ఆర్.టి. పాఠ్య పుస్తకం. 2. యస్.సి.ఇ.ఆర్.టి. పాఠ్యపుస్తకం 3. దీక్ష ఇ-కంటెంట్ 4. డిడి సప్తగిరి విద్యావారధి వీడియోలు:	1. వివిధ రకాల ఆవరణ వ్యవస్థలు, ఆహారపు జాలకం, నిచ్ చర్చ (పేజినెం.207 నుండి 209) 2. జీవావరణ పిరమిడ్లు సంఖ్యా, ద్రవ్యరాశి, శక్తిపిరమిడ్లు (పేజినెం.210-215) 3. జైవిక వ్యవస్థాపనం, జైవిక వృద్ధీకరణం అంశాలు: చర్చ (పేజినెం.219) 4. నివారణ చర్యలు (పేజినెం.224)	1. పరిచయం, ఆహారపు గొలుసు పేజినెం. 207, 208 2. కృత్యం-1 పేజినెం. 218	1. కొల్లేరు కథ పేజినెం.215 నుండి 217 2. భారలోహాలు: (పేజినెం.220, 221) 3. పిచ్చుక మీద బ్రహ్మాస్త్రం పేజినెం.222

విషయం : జీవశాస్త్రం

వారం/విషయము	అభ్యసన ఫలితాలు	వనరులు	తరగతి గదిలో చేయవలసిన కృత్యాలు	ఇంటి పని / విద్యార్థి కృత్యాలు	ఐచ్ఛికంగా చేయదగిన కృత్యాలు
వారం - 17 **సహజ వనరులు**	విద్యార్థి 1. నుస్థిరాభివృద్ధి భావనను వివరించును 2. 4ఆర్ భావనను: సోదాహరణంగా వివరించును: 3. వనరులను అధికంగా ఉపయోగిస్తే మానవాళి జీవితం ఏవిధంగా మారునో విశ్లేషించును. 4. సహజవనరులు అంతరిస్తే ఏర్పడే పరిణామాలను పరికల్పన చేయును. 5. వివిధ రకాల వనరులను గుర్తిస్తాడు. 6. సుస్థిరాభివృద్ధి లోగోలను గీయు నైపుణ్యం కలిగియుండును. 7. సహజవనరులను పునరుద్ధరించే మార్గాలను సూచించును.	1. ఎ.పి. యస్.సి.ఇ.ఆర్.టి. పాఠ్య పుస్తకం. 2. యస్.సి.ఇ.ఆర్.టి. పాఠ్యపుస్తకం 3. దీక్ష ఇ-కంటెంట్ 4. డిడి సప్తగిరి విద్యావారధి వీడియోలు:	1. మన చుట్టూ ఉండే సూజవనరులు-సుస్థిరాభివృద్ధి - చర్య (పేజినెం.236-238) 2. సంరక్షణ-మన ముఖ్యమైన భాతృత (పేజినెం.242-243) 3. సంరక్షణా సమూహాలు (పేజినెం.244)	1. కృత్యం-1 పేజినెం. 236 2. కృత్యం-2 పేజినెం. 241	1. సందర్భం-1 పేజినెం.227-232 2. అందరికీ నీరు (పేజినెం.232) 3. సందర్భం-2 పేజినెం.232-235 4. ఆంధ్రప్రదేశ్‌లో నీటి పారుదల కోసం అందుబాటులో ఉన్న నీటివనరులు 5. అడవి, నేల, జీవ వైవిధ్యం, శిలాజ ఇంధనలు, ఖనిజాలు. కృత్యం-3 పేజినెం.238-242

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విషయం : జీవశాస్త్రం

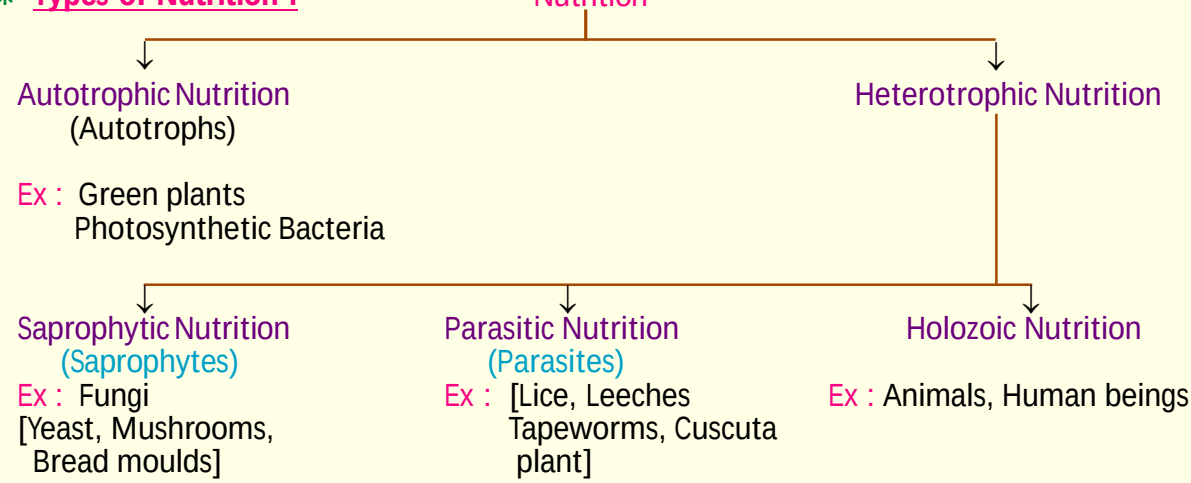
వారం/విషయము	అభ్యసన ఫలితాలు	వనరులు	తరగతి గదిలో చేయవలసిన కృత్యాలు	ఇంటి పని / విద్యార్థి కృత్యాలు	ఐచ్ఛికంగా చేయదగిన కృత్యాలు
వారం - 18 **పర్యావరణం**	విద్యార్థి 1. భౌగోళిక పచ్చదనానికి, రేణుయుత కాలుష్యానికి గల కారణాలను విశ్లేషించును. 2. జంతు ప్రదర్శన శాలల యొక్క ప్రాముఖ్యతను వివరించును. 3. తీవ్రమైన నహజ వనరుల తగ్గుదల మీద అనేక రకాల పరికల్పనాలు చేయును. 4. టీకాలు ఇప్పడం, సహజ అనారోగ్యానికి సంబంధించిన సమాచారాన్ని స్వీకరించును. 5. భౌగోళిక వెచ్చదనానికి, కాలుష్యానికి ఫ్లోరోసిస్ తగ్గించడానికి మార్గాలు: చూపును. 6. సహజ వనరులైన నీరు, శిలాజ ఇంధనాలను పరిరక్షించుటకు మార్గాలను చూపును. 7. సహజవనరులను పునరుద్ధరించే మార్గాలను సూచించును.	1. ఎ.పి. యస్.సి.ఇ.ఆర్.టి. పాఠ్య పుస్తకం. 2. యస్.సి.ఇ.ఆర్.టి. పాఠ్యపుస్తకం 3. దీక్ష ఇ-కంటెంట్ 4. డిడి సప్తగిరి విద్యావారధి వీడియోలు:	1. భౌగోళిక వెచ్చదనం 2. గాలిలోని రేణీయుత కాలుష్య కారకాలను: అంచనా వేయుట. 3. శిలాజ ఇంధనాలు: నిరంతరం లభించవు. 4. సోలార్ విద్యుత్ వాడదాం- సాంప్రదాయ విద్యుత్తును తగ్గిద్దాం. 5. సహజ వనరుల పరిరక్షణ 6. భూగర్భ జలాల సద్వినియోగం 7. సహజ వనరుల తరుగుదల: 8. నీటి సంరక్షణ 9. ఫ్లోరోసిస్	1. టీకాలు ఎందుకు వేయించుకోవాలి. 2. దోమల బెడద 3. నాసిరకపు వస్తువులు వాటి వినియోగం వల్ల పర్యావరణం పై ప్రభావం. 4. జంతుప్రదర్శన శాలలు అవసరమా? 5. మన పరిసరాలలో నీటి వనరులు: 6. ప్రకృతి వైపరిత్యాలలో మనం ఏం చేయాలి? 7. ప్రకృతిని పవిత్రంగా చూద్దాం. 8. సాధారణ ఆరోగ్య సమస్యలపై అవగాహన 9. ఇంటివాతావరణం ఆరోగ్యంగా ఉంచుకుందాం	1. పర్యావరణ పరిరక్షకులు 2. మన పరిసరాలో మార్పులు వాటి ప్రభాశాలు 3. మొక్కలు-కీటకాల మధ్య ప్రతిచర్యలు-పరాగ సంపర్కం 4. 3ఆర్ ల పరిశీలన 5. గ్రామీణ ప్రాంతాల పట్టణీకరణ ఉపాధి అవకాశాలు: 6. చుట్టూ నీరు-అయినా దాహం 7. ప్రకృతి-సంస్కృతి ప్రజల మధ్య సంబంధాలు 8. చెత్తను: సేకరించేవారి దుస్థితి 9. అభివృద్ధి పథకాలు ప్రభావాన్ని అంచనా వేద్దాం.

1. NUTRITION
(FOOD SUPPLYING SYSTEM)

Lesson related Activities videos pl.scan QR

1, 2, 4 marks Question and Answers PDF pl.scan QR

* **Nutrition :** Procurement of nutrients is called Nutrition.
* **Nutrients :** 1. The chemical substances which are required for energy production, growth and body building are called Nutrients. Nutrients are 5 types. They are : 1. Carbohydrates 2. Proteins 3. Lipids 4. Minerals 5. Vitamins.
  2. These are present in the food materials such as grains, pulses, meat, oils, vegetables...
* **Types of Nutrition :**



Autotrophs	Heterotrophs
1. Organisms, which are prepare their food by own are called Autotrophs.	1. Organisms which can't prepare their food by own are called Hetritrophs
2. Ex : Green plants Photosynthetic Bacteria	2. Ex : Fungi, Animals
3. Chloroplasts are present	3. Chloroplasts are absent.
4. Photosynthesis occurs	4. Photosynthesis doesn't occurs

* Autotropes can prepare their food by own with the help of chloroplasts, through photosynthesis.
* **Saprophytic Nutrition :** Some organisms break down the food materials outside of the body and then absorb it. This type of nutrition is called Saprophytic Nutrition.
* **Parasitic Nutrition :** Some organisms derive their food from the body of other living organisms without killing them. This type of Nutrition is called Parasitic Nutrition.
* **Holozoic Nutrition :** Some organisms intake the food materials and break down it inside their bodies. This type of Nutrition is called Holozoic Nutrition.
* **Parasitic Nutrition in cuscuta :**
  - Cuscuta/Dodder is a leafless, twinning parasitic plant.
  - The dodder contains no chlorophyll. Hence it is not autotroph.
  - The root like organs that penetrate the tissue of a host plant to absorb food materials are called Haustoria.

Photosynthesis : Carbohydrates are synthesized in chloroplasts which are present in the green plants from CO_2 and water in the presence of sunlight. These photochemical reaction called as Photosynthesis.

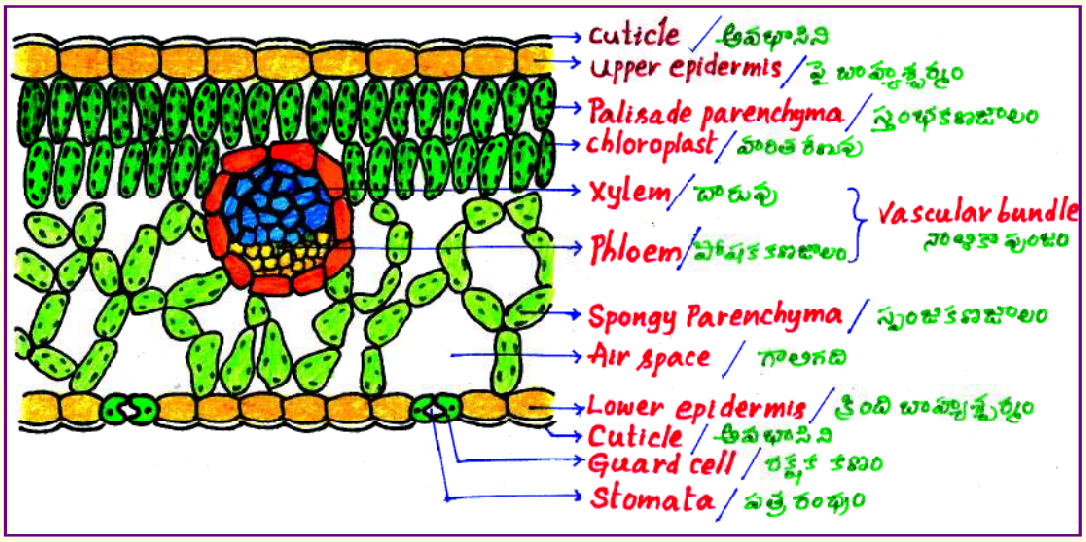
* C.B. Van Neils equation in 1931 is .....

$$CO_2 + 2H_2O \xrightarrow[\text{Chlorophyll}]{\text{Light}} CH_2O + H_2O + O_2$$

$$6CO_2 + 12H_2O \xrightarrow[\text{Chlorophyll}]{\text{Light}} C_6H_{12}O_6 + 6H_2O + 6O_2$$

* **Factors/Essential materials for photosynthesis are :**
  1. CO_2 [from air, through stomata]
  2. H_2O [through roots from soil]
  3. Light [from Sun]
  4. Chlorophyll [present in the leaves of plant]
* **End products of Photosynthesis are :**
  1. Glucose [$C_6H_{12}O_6$]
  2. Oxygen [O_2]
  3. Water [H_2O]
* Photosynthesis occurs in chloroplasts of the leaves of the plant.
* Plants → leaves (green parts) → Mesophyll → Chloroplast (plant cell)

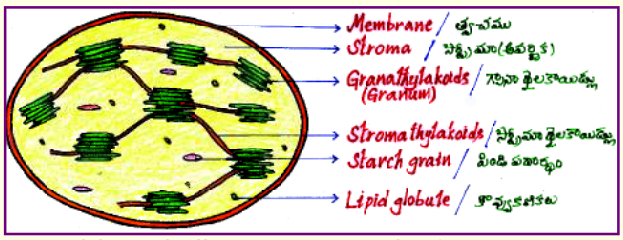
T.S. OF LEAF (TRANSVERSE SECTION OF LEAF)



Structure of Chloroplast :

1. In 1883, Julius Von Sachs discovered the chloroplast in leaf cell.
2. Chloroplasts are present in mesophyll of leaves and other greeny parts of the plant.
3. About 40-100 chloroplasts are present in a plant cell.
4. Typical chloroplasts are in disc shaped.
5. They are green in colour due to the presense of chlorophyll.
6. They are covered by a double layered membrane.
7. They are filled with colourless fluid called stroma.
8. Stalks of thylakoid membranes are located in stroma are called Grana (or) Grana thylakoids.
9. Grana thylakoids are connected by Stroma thylokoids.
10. Chlorophyll and other accessory pigments are located in the lipid part of the thylakoid membrane and they are organized to form the reaction centres called P.S.I and P.S.II (OR) light harvesting complex.

T.S. OF CHLOROPLAST (TRANSVERSE SECTION OF CHLOROPLAST)



- Chlorophyll contains Mg. Chlorophyll means green leaf.
- Chlorophyll A - Blue - green in colour. Chlorophyll B - Yellow - green in colour.

Chloroplast	Chlorophyll
1. It is an organelle present in plant cell.	1. It is a pigment present in chloroplast.
2. It is green in colour due to the presence of chlorophyll.	2. It is green in colour due to it reflects the green light of the sunlight.
3. It is responsible for photosynthesis.	3. It is responsible for trapping the light for photosynthesis.
4. The entire process of photosynthesis occurs in chloroplast.	4. The process of photosynthesis starts with the help of cholorophyll.

- **The upper surface of the leaf more greeny and shiny than the lower surface, because ...**
- Upper surface of the leaves contains palisade parenchyma while lower surface contains spongy parenchyma.
- Palisade parenchyma contains more chloroplasts than spongy parenchyma.
- Chloroplasts are green in colour due to the presense of chlorophyll. Chlorophyll reflects the green light.
- Due to this reason, the upper surface of the leaf more greeny and shiny than the lower surface.

Process of Photosynthesis

There are two major phases are found in photosynthesis.
The are : 1. Light reactions / photo chemical reactions
2. Dark reactions / Light independent reactions.

1. Light reactions : (Photo chemical phase)

- Some reactions of photosynthesis that occurs only in the presense of light are called Light reactions.
- During this phase light energy converted into chemical energy. i.e., ATP and NADPH. So, this phase is technically called as Photochemical phase.
- This phase of reactions takes place in the Grana of the chloroplast.
- Light reactions occur in several steps :
  Step - I : When the light falls on the chlorophyll, it becomes activated by absorbing photons.
  Step - II : Photolysis / Hill reaction
- This energy is used in splitting the water molecule into ions.
- $H_2O \rightarrow H^+ + OH^-$
- This reaction is known as photolysis, which means splitting by light. It is discovered by the scientist Hill. Hence, it is called as Hill's reaction.

  Step - III : The highly reactive ions (H^+, OH^-) of water undergoes quick changes in two different directions.
- OH^- ions produce water (H_2O) and O_2 through a series of steps.
- H^+ ions undergo series of changes and formed ATP and NADPH. These are also called assimilatory powers.
- The end products of light reactions are O_2, ATP and NADPH.

2. Dark Reactions / Calvin cycle / Light independent reactions / Bio synthetic Phase :

- The term Dark reaction does not mean that they occur when it is dark at night. It only means that the reactions are not depend on light. Hence, it is better to call the dark phase as a light independent phase.
- Dark reactions are discovered by Melvin Calvin. So, the cycle of reactions is called Calvin Cycle.
- Dark reactions occur in stroma of the chloroplast.
- During Dark reactions CO_2 is converted into Glucose, by utilising ATP and NADPH which produced in light reactions, with the help of RuBP and enzymes.
- Finally Glucose is converted into starch.

Light reactions	Dark reactions
1. It is the first phase in the photosynthesis.	1. It is the second phase in the photosynthesis.
2. Occurs in the grana of the chloroplast.	2. Occurs in the stroma of the chloroplast.
3. This reactions occur only in the presence of light.	3. This reactions occur in the presence (or) absence of light.
4. Chlorophyll plays key-role.	4. RuBP plays key role.
5. Light energy converted into chemical energy	5. CO_2 converted into glucose.

- ATP and NADPH are the connecting substances between light reactions and dark reactions because ....

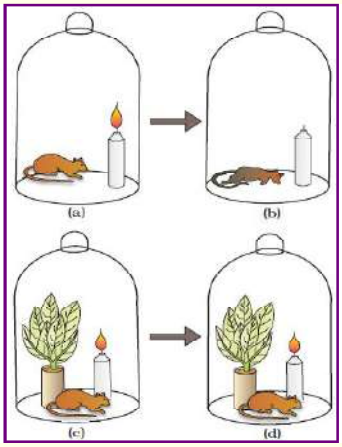
  During Dark reactions CO_2 is converted into Glucose by the utilising of ATP and NADPH which are produced in light reactions. So, ATP and NADPH are the connecting substances between light reactions and dark reactions.

Importance of Photosynthesis :-

- All living organisms need energy to be alive. They get energy in the form of food.
- Photosynthesis is the only process on earth to prepare food by utilising light energy and releasing O_2 into atmosphere.
- Hence, all living organisms depend directly or indirectly on photosynthesis for their food requirements and O_2.
- Hence photosynthesis is considered as the basic energy source for most of living world.
- So, without green plants, there could be no life on earth.
- For that, I appreciated the photosynthesis for its amazing mechanism.

Joseph Priestly's Experiment

1. Priestly took two bell jars.
2. One jar inverted over a burning candle and another one on a mouse.
3. Then he observed that the burning candle gets extinguished. Similarly mouse would soon suffocated.
4. After that he placed a mint plant in the same bell jars and did the same experiment.
5. Then we observed that the candle did not extinguish and the mouse did not suffocate, stayed alive.
6. Priestly hypothesized as, plants restore to the air whatever breathing animals and burning candles remove.
7. This experiment says that plants were giving out a gas that supported burning and was essential for the survival of animals.



1. TEST THE PRESENCE OF STARCH IN LEAVES

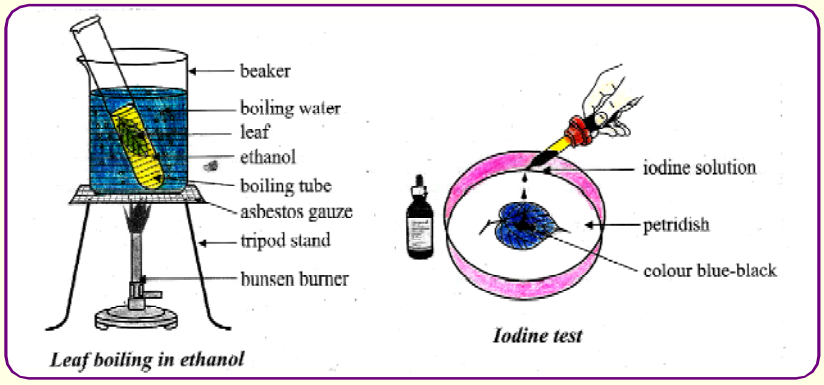
AIM :

To test the presence of starch in leaves.

APPARATUS :

1. Beaker
2. Test tube
3. Water
4. Methylated spirit (Ethanol)
5. Tripod stand
6. Asbetos gauze
7. Bunsen burner
8. Petridish
9. Iodine solution
10. Leaf
11. Dropper

DIAGRAM :



PROCEDURE :

1. Take a leaf of potted plant.
2. Boil the leaf in methylated spirit over a water bath.
   (if we boil the leaf in methylated spirit directly on bunsen burner, spirit will burn)
3. Till leaf becomes pale white.
   (chlorophyll dissolved in the methylated spirit leaf become pale white)
4. Spread the leaf in a petridish.
5. Add a few drops of iodine on it.

OBSERVATION :

1. Leaf turns into blue-black colour.
2. It indicates that the leaf contains starch.

INFERENCE :

This experiment proves that leaf contains starch.

PRECAUTIONS :

1. We should boil the leaf in methylated spirit over a water bath carefully.
2. We should boil the leaf till it will become pale white.

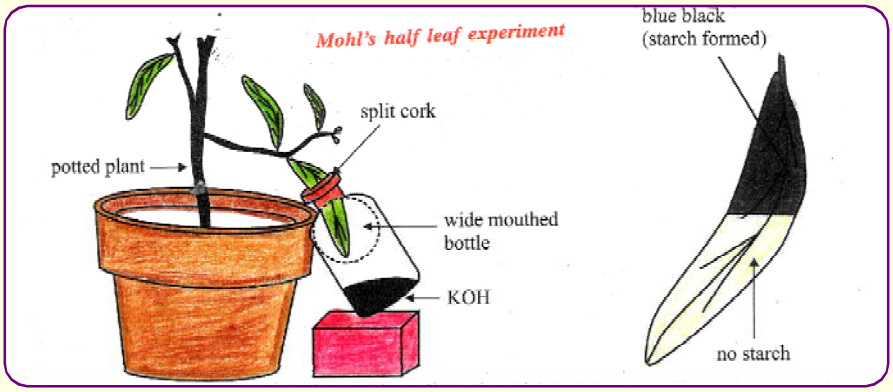
2. CO_2 IS ESSENTIAL FOR PHOTOSYNTHESIS

AIM : To prove that CO_2 is essential for photosynthesis.

APPARATUS :

1. Potted plant 2. Wide mouthed transparent bottle 3. KOH solution
4. Split cork 5. Iodine solution 6. Grease

DIAGRAM :



PROCEDURE :

1. Take a potted plant with long and narrow leaves.
2. Keep it into dark room for a week days. (due to this, leaves are free from starch)
3. Take a glass bottle. 4. Take 5-6 ml of KOH solution into the bottle.
   (it absorbs the CO_2 which is present in the bottle)
5. Insert half of the leaf into the bottle.
6. Close the bottle with split cork and grease.
   (it prevents the entering of CO_2 into the bottle)
7. Keep the entire setup in sunlight for 4-5 hours.
8. Detach the leaf from the plant. 9. Test the leaf by iodine solution.

OBSERVATION :

1. Part of the leaf outside the bottle turns into blue-black colour.
2. Part of the leaf inside the bottle does not turns blue-black colour.

INFERENCE : This experiment proves that CO_2 is essential for photosynthesis.

PRECAUTIONS : 1. Before inserting the leaf we should take KOH solution into the bottle.
2. We should close the bottle without leaving any gap.

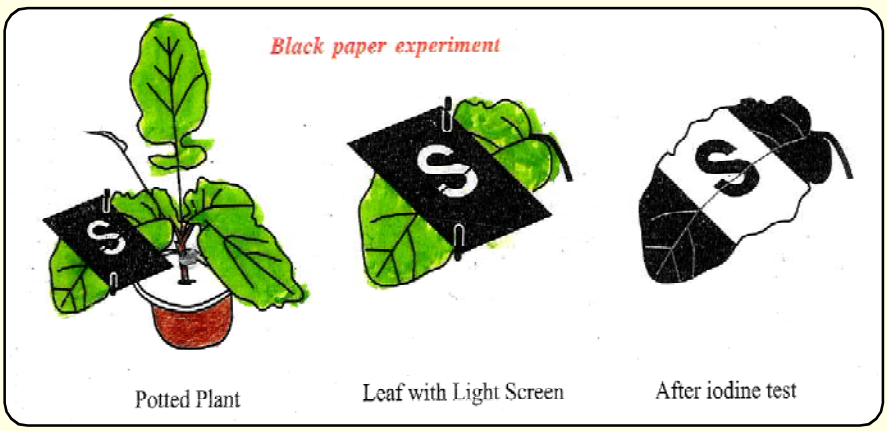
3. LIGHT IS ESSENTIAL FOR PHOTOSYNTHESIS

AIM : To prove that light is essential for photosynthesis.

APPARATUS :

1. potted plant 3. Piece of black chart
2. Iodine solution 4. Clips

DIAGRAM :



PROCEDURE :

1. Take a potted plant.
2. Keep it into the darkroom for a week days.
   (due to this, leaves are free from starch)
3. Select a leaf and cover it with a piece of black chart as shown in the diagram.
   (black chart stops sunlight. So, that part of leaf does not exposed to sunlight)
4. Keep the entire set up in sunlight for 4-5 hours.
5. Detach the leaf from the plant.
6. Remove the chart piece and test the leaf by using iodine solution.

OBSERVATION :

Entire leaf turns blue-black colour except the part covered by the black chart.

INFERENCE :

This experiment proves that light is essential for photosynthesis.

PRECAUTIONS :

We should fix the black chart on the leaf tightly by using clips.

4. O_2 IS LIBERATED DURING PHOTOSYNTHESIS

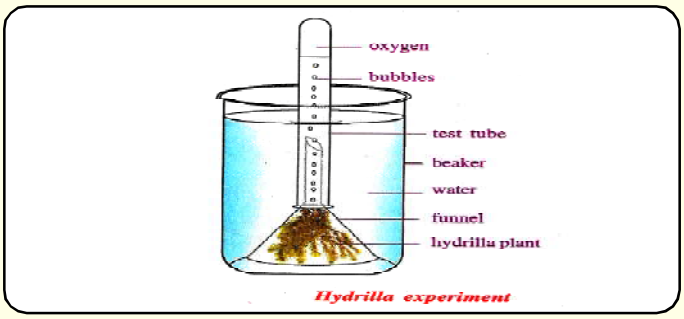
AIM :

To prove that O_2 is liberated during photosynthesis.

APPARATUS :

1. Beaker
2. Test tube
3. Hydrilla plants
4. Glass funnel
5. Water
6. Glowing splinter

DIAGRAM :



PROCEDURE :

1. Take a beaker.
2. Fill with water.
3. Take a funnel.
4. Insert hydrilla plants in it.
5. Keep funnel into the beaker as shown in the diagram.
6. Take a test tube filled with water. 7. Invert it over the funnel.
8. Keep the entire setup in sunlight.

OBSERVATION :

1. Small gas bubbles are come out from the hydrilla plants.
2. These gas bubbles collected at the end of the test tube.
3. Then test the gas with splinter.
4. The splinter glows and burns vigorously.

INFERENCE :

This experiment proves that O_2 is liberated during photosynthesis.

PRECAUTIONS :

1. We should use submerged aquatic plants only.
2. Carefully invert and remove the test tube without entering air.

✳ It is necessary to destarch a plant before performing any experiment on photosynthesis, because ....

In any experiment on photosynthesis we have to do Iodine test. When we perform iodine test, if starch is present it may interfered with the result of the experiment.

✳ We can't demonstrate respiration in green plants kept in sunlight, because ...

When we kept the plant in sunlight, photosynthesis occurs in plant. The end products of photosynthesis ($C_6H_{12}O_6$ *and* O_2) are the raw materials for respiration. So, we can't demonstrate respiration in green plant kept in sunlight.

✳ If the concentration of CO_2 increases in the air, the rate of photosynthesis also increases to a certain extent and stands still there itself.

✳ The end products of the photosynthesis is Glucose. It is utilised in respiration and gives energy. If respiration overtakes photosynthesis in a plant Glucose is not sufficient for respiration. Hence, it leads to the death of the plant.

Human Digestive System - Digestion

Ingestion : Intake of food materials through mouth is called ingestion.

Digestion : The large complex food molecules break down into small, simple molecules in the alimentary canal with the help of enzymes is called digestion.

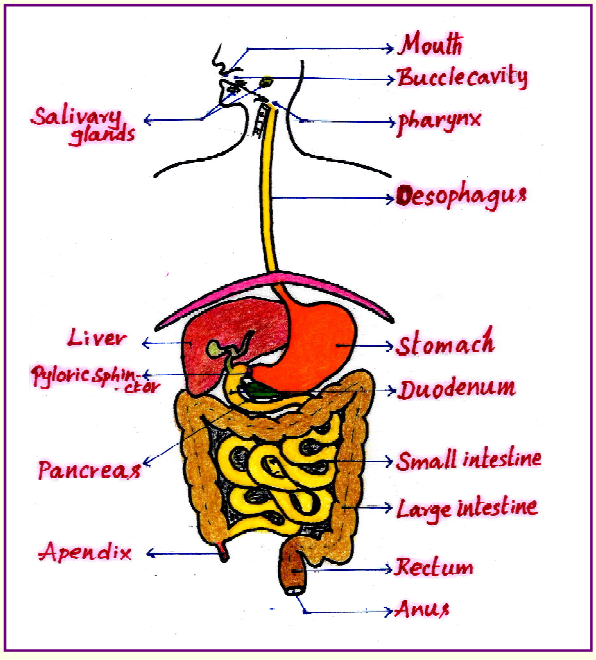
Absorption : The passage of digested food through the walls of alimentary tract into circulatory system.

Assimilation :- Digested food materials, which are present in blood enter into cells is called Assimilation.

Defecation (or) Egestion : The passage of undigested food materials from the body by the way of anus.

☛ Human digestive system contains alimentary canal and digestive glands.

☛ The alimentary canal is a long tube, starts from the mouth and ends with the anus.



Sl. No.	Name of the Digestive gland	Digestive juice	Secreted into	Containing enzyme	Acts on	Converted into
1.	Salivary glands	Saliva	Buccal cavity	Ptyalin	Carbohydrates	Dextrins & Maltose
2.	Gastric glands	Gastric juice	Stomach	Pepsin	Proteins	Peptones
3.	Liver	Bile juice	Duodenum	No enzymes but "Bile Salts"	Fats	Small globules
4.	Pancreas	Pancreatic juice	Duodenum	1. Amylase	Carbohydrates	Maltose
				2. Trypsin	Proteins	Peptomes
				3. Lipase	Fats	Fatty acids and Glycerol
5.	Intestinal glands	Intestinal juice (or) success entiricus	Small intestine	1. Maltase	Maltose	Glucose
				2. Sucrase	Sucrose	Glucose
				3. Lactase	Lactose	Glucose
				4. Peptidase	Peptones	Amino acids
				5. Lipase	Fats	Fatty acids & glycerol

Digestive enzymes :

- 1.The chemical substances that are help in digestion are called digestive enzymes.
- 2.Digestive enzymes are secreted by digestive glands into alimentary canal.
- 3.Enzymes are responsible for digestion.
- 4.They break down the large complex food materials into small simple molecules.

Enzymes acts on	-	Converted into
Carbohydrates	-	Glucose
Proteins	-	Amino acids
Lipids	-	Fatty acids and Glycerol

- Process of digestion in human digestive system :-

  Intake of food materials into the body through mouth is called ingestion.

- In Buccal cavity :-

  - Food is masticated by our teeth and mixed with saliva to make it slippery and wet. In this stage slippery food called as Bolus.
  - Saliva contains Ptyalin Enzyme. This enzyme converts the carbohydrates into dextrins and maltoses.

- Bolus passes through oesophagus by wave like movements called peristalitic movements to the stomach.

- In stomach :-

  - At the stomach food gets churned with gastric juice and Hcl.
  - Gastric juice contains pepsin enzyme. It converts the proteins into peptones.

- Role of Hcl :

  - Hcl creates an acidic medium which facilitates the action of enzyme pepsin.
  - Kills the germs present in the food.

- In stomach food is in the form of a soft slimy substance where some proteins and carbohydrates have already been broken down. This is called chyme.

- Partially digested food chyme is released in small amounts by pyloric sphincter muscles reach small intestine.
- In Duodenum :-
  - Duodenum is the first part of the small intestine.
  - Bile juice secreted by liver and pancreatic juice secreted by pancreas, release into Duodenum.
  - Bile juice does not contain enzymes. But it contain 'Bile salts'. Emulsification of fats is done by Bile juice.
  - Emulsification means big fat molecules are converted into small globule like forms by the help of bile juice.
  - Pancreatic juice contains three enzymes. They acts as follows
    1. Carbohydrates $\xrightarrow{\text{"Amylase"}}$ Maltose
    2. Proteins $\xrightarrow{\text{"Trypsin"}}$ Peptones
    3. Fats $\xrightarrow{\text{"Lipase"}}$ Fatty acids and glycerol
- In small intestine :-
  - Complete digestion of carbohydrates, proteins, fats takes place in the small intestine by intestinal juice.
  - Intestinal juice contains more than 5 enzymes acts as follows.

  1. Maltose $\xrightarrow{\text{"Maltase"}}$ Glucose
  2. Sucrase $\xrightarrow{\text{"Sucrase"}}$ Glucose
  3. Lactose $\xrightarrow{\text{"Lactase"}}$ Glucose
  4. Peptones $\xrightarrow{\text{peptidase}}$ Amino acids
  5. Fats $\xrightarrow{\text{"Lipase"}}$ Fatty acids + Glycerol.

  - Finger like projections present in the walls of the small intestine are called Villi. They absorb the digested food into the blood.
  - Un-digested food is sent into large intestine.
- In Large intestine most of the water present in the non-digested food is absorbed into the blood.
- This material is then expelled through the anus which is the last part of the alimentary canal.

* Carbohydrates are not digested in the stomach because ...
  - As the medium in the stomach is acidic, the carbohydrates are not digested in the acidic medium.
  - For the digestion of carbohydrates, enzymes ptyalin or amylase are required. They can't present in the gastric juice. So, carbohydrates are not digested in the stomach.
- Roughages are fibres of either carbohydrates or proteins. They help in easy movement of food materials in alimentary canal and it prevents constipation. These are rich in vegetables, fruits ...
- Malnutrition :
  - Eating of food that does not have one or more than one nutrients in the required amount is known as Malnutrition.
  - Malnutrition is of three types.
    - Calory Malnutrition
    - Protein Maluntrition
    - Protein calory Malnutrition

✳ Causes for Malutrition

- ☛ Poor health
- ☛ Will full starvation
- ☛ Lack of awareness of nutritional habits
- ☛ Poor socio economic factors

✳ Example for Malnutrition diseases :-

1. Kwashiorkor 2. Marasmus

1. Kwashiorkor disease :-

- ✳ This is due to protein deficiency in diet.
- ✳ Body parts become swollen due to accumulation of water in the intercellular spaces.
- ✳ Swollen legs, fluffy face.
- ✳ Difficult to eat.
- ✳ Dry skin are the symptoms.

2. Marasmus disease :-

- ✳ This is due to protein and calories deficiency in diet.
- ✳ Lean and weak.
- ✳ Swelling limbs.
- ✳ Less developed muscles.
- ✳ Dry skin.
- ✳ Diarrhea are the symptoms of this disease.

☛ Obesity :-

- ✳ This is due to overeating and excess of energy intake.
- ✳ It is a big health hazard. It leads to ... Diabetes, Cardio vascular, Renal, Gall bladder problems.
- ✳ Only way to treat obesity is to increase the energy expenditure and reduce the energy intake.

✳ After reading this chapter I am going to follow the food habits are ...

1. I take balanced diet which contains proper amounts of Carbohydrates, Proteins, Lipids, Minerals and Vitamins.
2. I eat food as much required by my body.
3. I do not overeat.
4. I will see to have plenty of roughages in the diet for preventing constipation.
5. I should drink more water.
6. Junk food causes obesity. So, I avoid junk foods.
7. I should take proper food time to time daily for avoiding acidity.
8. Frequently I should take leafy vegetables, vegetables, milk and eggs in my diet for minerals and vitamins.
9. I should masticate the food thoroughly before swallowing.
10. I should not do violent exercise soon after eating food.

✳ Saliva - Alkaline in nature.

✳ Gastric juice - Acidic in nature.

✳ Vitamins :-

☛ Vitamins are organic substances.

☛ These are micro-nutrients required in small quantities.

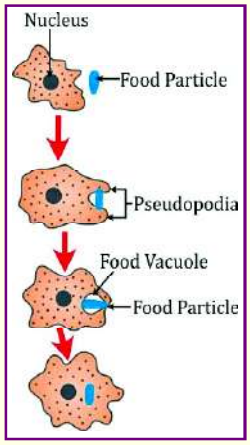
☛ Vitamins are classified into two groups.

1. Water soluble vitamins :- B complex & C
2. Fat soluble vitamins :- A, D, E and K

Sl. No.	Vitamin	Resources	Deficiency diseases	Sypmtoms	Type
1.	Thiamine (B_1)/ meat	Cereals, oil seeds, vegetables, milk, meat, fish, eggs.	Beri beri	Vomtings, fits, loss of appetite, difficulty in breathing, paralysis.	Water soluble
2.	Riboflavin (B_2)	Milk, eggs, liver, kidney, green leafy vegetables.	Glossitis	Mouth cracks at corners, red and sore tongue, photophobia, scaly skin.	
3.	Niacin (B_3)	Kidney, liver, meat, egg, fish, oil seeds.	Pellagra (Skin disease)	Dermatitis, diarrhea, loss of memory, scaly skin.	
4.	Pyridoxine (B_6)	Cereals, oil seeds, vegetables, milk,fish,meat,liver, eggs	Anemia	Hyper irritability, nausia, vomitings, fits.	
5.	Cyanocoba-lamine (B_{12})	Synthesized by bacteria present in the intestine.	Pernicious anaemia	Lean and weak, less appetite.	
6.	Folic acid (B_9)	Liver, meat, eggs, milk, fruits, cereals, leafy vegetables	Anaemia	Diarrhea, loss of lecocytes, intestinal mucus problems.	
7.	Pantothenic acid (B_5)	Sweet potatoes, groundnuts, vegetables, liver, kidney, egg.	Burning feet	Walking problems, sprain.	
8.	Biotin (B_7)	Pulses, nuts, vegetables, liver, milk, kidney.	Nerves disorders	Fatigue, mental depression, muscle pains.	
9.	Ascorbic acid (C)	Green leafy vegetables, citrus fruits, sprouts.	Scurvy	Delay in healing of wounds, fractures of bones, bleeding in gums.	
1.	Retinol (A)	Leafy vegetables, carrot, tomato, pumpkin, papaya, mango, meat, fish egg, liver, milk, cod liver oil, shark liver oil.	Eye, skin diseases	Night blindness, xeropthalmia, cornea failure, scaly skin.	Fat soluble
2.	Calciferol (D)	Liver, egg, butter, cod liver oil, shark liver oil, (morning sun rays).	Rickets	Improper formation of bones, knockness, swollen wrists, delayed denition, week bones.	
3.	Tocoferol (E)	Fruits, vegetables, sprouts, meat, egg, sunflower oil.	Fertility disorders	Sterility in males, abortions in females.	
4.	Phylloqui-none (K)	Green leafy vegetables, milk.	Blood clotting delayed	Delay in blood clotting over bleeding.	

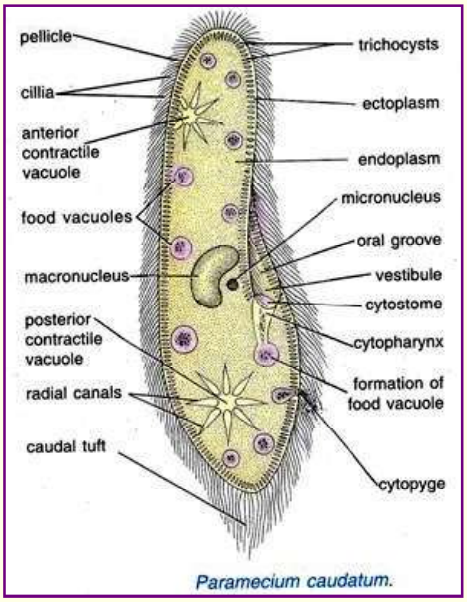
✳ Nutrition in Amoeba :-

- Amoeba takes food by using temporary finger like extension (pseudopodia) of the cell surface.
- Inside the food vacuole, complex substances are broken down into simpler ones which then diffuse into cytoplasm.



✳ Nutrition in paramoecium :-

- It is a unicellular organism.
- It is also called as slipper animalcule.
- Food is taken in at a specific spot called cytostome.
- Food is moved to the spot by movement of cilia which covers the entire surface of the surface.



Paramecium caudatum.

✳ Vomiting :-

1. It is a method of ridding ourself of unwanted or harmful substances from the stomach.
2. During vomitation reverse peristalitic movements occurs in stomach and oesophagus
3. Hence the food is expelled out.
4. Causes of vomiting :-

   A. Overeating

   B. Food poisoning

   C. Taking high proportion of fat containing food.

2. RESPIRATION
(The energy releasing system)

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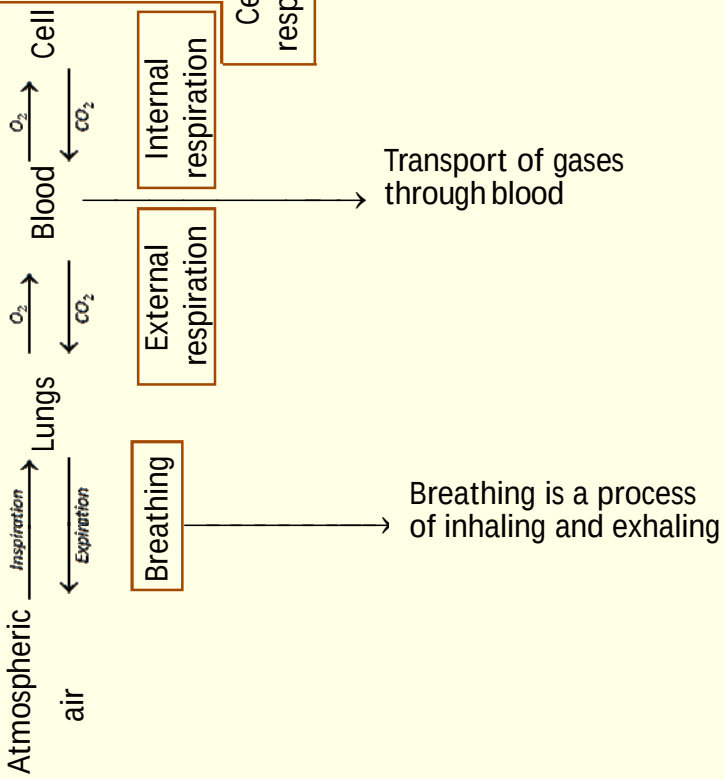
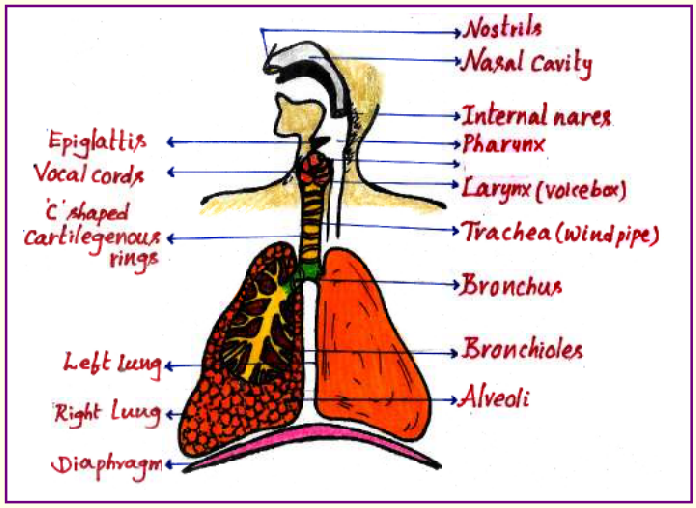
- The term 'Respiration' comes from a latin word 'Respire' meaning 'to breath'.
- Respiration is the process by which food is broken down for the release of energy.

$C_6H_{12}O_6 + 6O_2 \rightarrow$
$6CO_2 + 6H_2O + 38\,ATP\,(energy)$

Cellular respiration



Human Respiratory System



Nostrils : ✳ These are the openings of the respiratory system.

✳ Air usually enters the body through the nostrils.

Nasal cavity : ✳ Nostrils opens into nasal cavity.

✳ Due to hairs present in nasal cavity air is filtered.

✳ The lining of the nasal cavity contains moist surface.

3. TRANSPORTATION
(THE CIRCULATORY SYSTEM)

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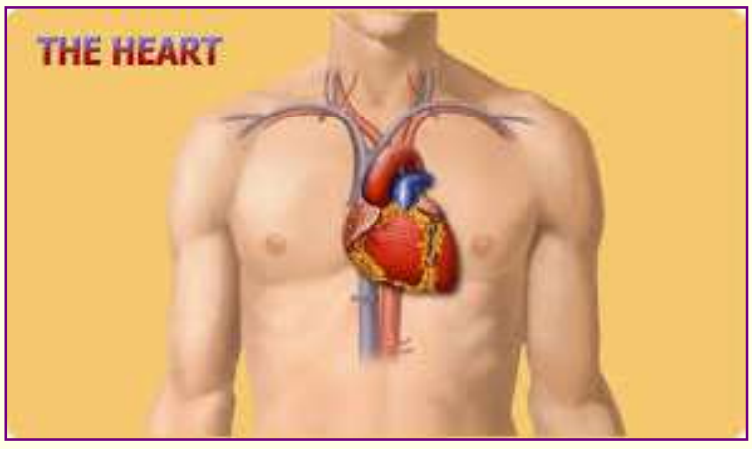
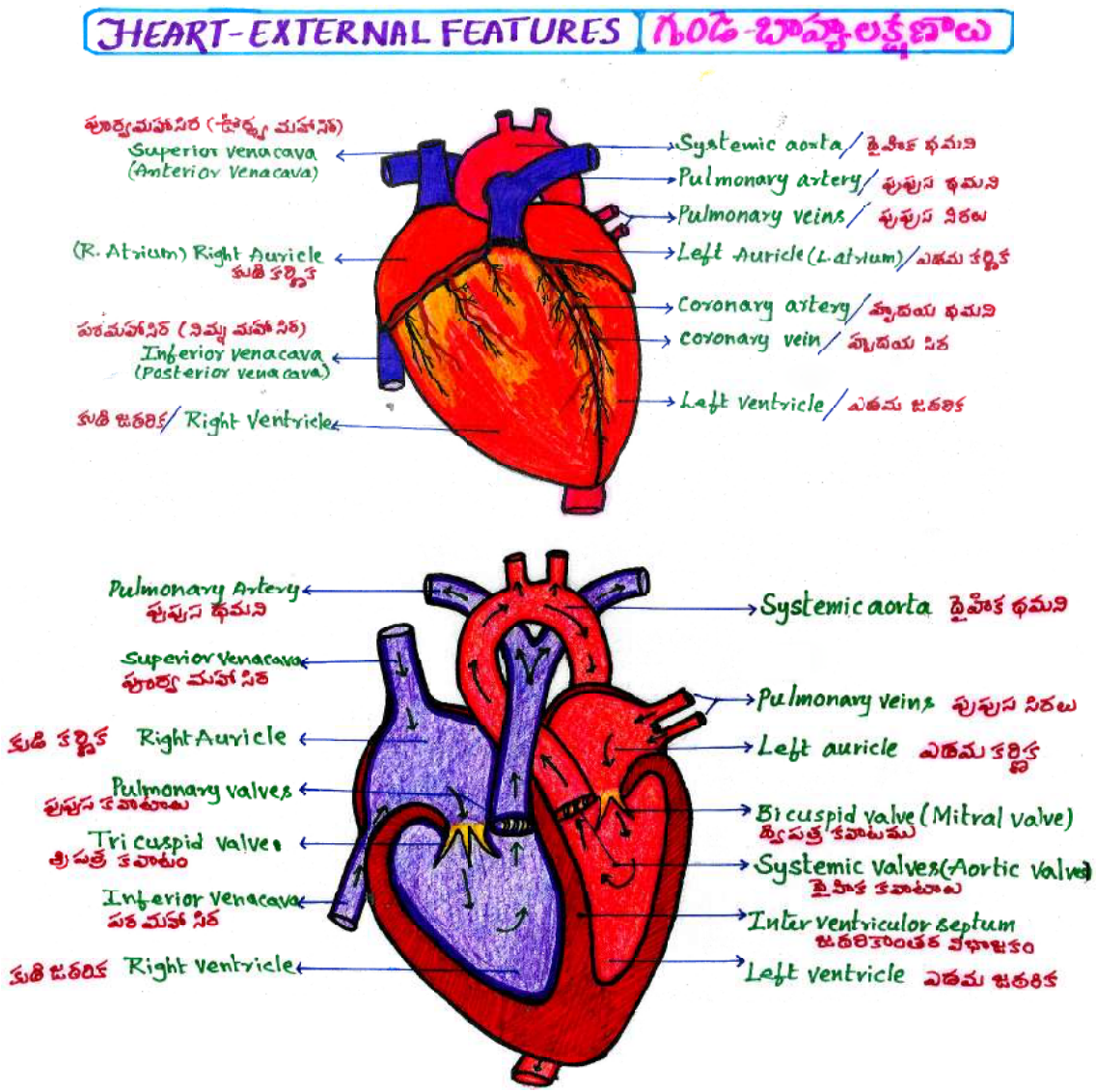
- Transportation is a life process which transports the materials between various parts of the body.
- Transport system consists of heart, blood and blood vessels.
- Blood flows continuously in our body through blood vessels with the help of heart.
- Blood transports the digestive food materials from digestive system to all parts of the body.
- Transports O_2 from lungs to all parts of the body.
- Transports CO_2 from all parts of the body to lungs.
- Transports the nitrogenous waste materials from all parts of the body to kidneys.
- Transports hormones from endocrine glands to where ever it is necessary.

HEART

- Heart is the vital organ of human beings.
- It is located between the two lungs protected by ribcage.
- It is made up of cardiac muscle.
- It is the size of the fist of the person.
- It is pear shaped, wider at the anterior end and narrower at the posterior end.
- It is covered by two layers of membranes are called pericardial membranes.
- The space between two pericardial layers is filled with pericardial fluid.
- The blood vessels which are present in the walls of heart are coronary vessels which supply blood to the muscles of the heart.
- Internally heart is divided into 4 chambers.
- Two upper chambers are called Auricles/Atria.
- Two lower chambers are called ventricles.
- The walls of the ventricles are thicker than atrial walls.
- The right auricle and ventricle are larger than the left auricle and ventricle.
- Right and left auricles are separated by a inter-auricular septum.
- Right and left ventricles are seperated by a inter-ventricular septum.
- Right auricle opens into right ventricle through right auriculo-ventricular aperture.
- Left auricle opens into left ventricle through left auriculo-ventricular aperture.
- Tri-cuspid valve is located at right Auriculo-ventricular aperture.
- Bi-cuspid valve is located at left Auriculo-ventricular aperture.
- Superior and inferior venacavas are open into the right auricle.
- Two pulmonary veins are open into the left auricle.
- Pulmonary artery originates from the right ventricle.
- Systemic aorta originates from the left-ventricle.





INTERNAL STRUCTURE OF HEART

Blood Vessels

* Types of Blood vessels :-

- Based on work, blood vessels are classified into three types. They are :
  1. Arteries 2. Veins 3. Capillaries
- Arteries :- The blood vessels which carry blood from heart to body parts are called arteries.
- Veins :- The blood vessels which carry blood from the body parts to heart are called veins.
- Capillaries :-
  * Capillaries are the smallest blood vessels, which connects the arterioles and venules.
  * The walls of capillaries are made of single layer of cells. They allow diffusion of various substances.
  * Arterioles of artery and venules of veins join with microscopic vessels called capillaries.
  * Materials (O_2, CO_2, Glucose) exchange between blood and cells occurs in capillaries.

4. EXCRETION
(THE WASTAGE DISPOSING SYSTEM)

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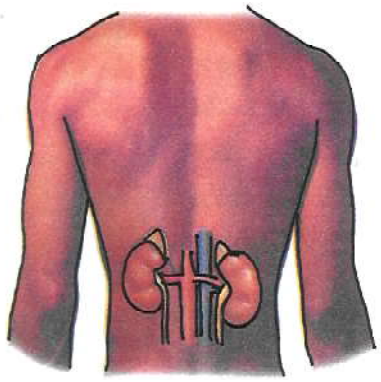
Excretion :-

- The word Excretion taken from latin.
- In latin ex means out, crenere means shift.
- Excretion is one of the life process. In this process waste un-useful and harmful products are separated and removed from the body. (or) Elimination of wastes from the body which are formed during diffrent metabolisms is called excretion.
- A number of reactions take place during various metabolic activities in our body.
- In this metabolic activities many useful substances and energy are produced.
- At the same time many waste/unuseful products also formed. Such as CO_2, water, nitrogenous wastes, Bile pigments etc ...
- These waste/un-useful products enters into the blood.
- Blood transports these products into various excretory organs. These organs separated and removed from the body.

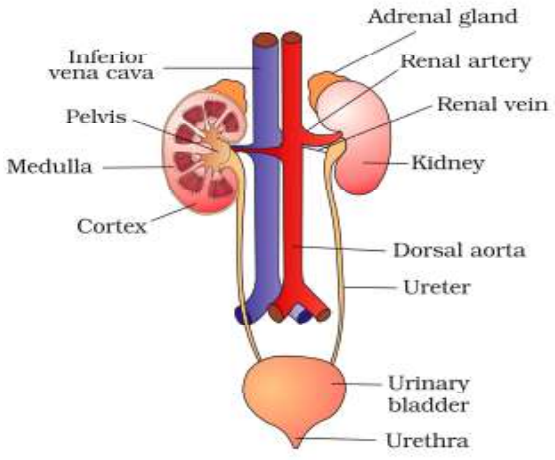
S.No.	Excretory organ	Eliminated substances
1.	Kidney	Excess water, excess minerals, nitrogenous wastes in the form of urine.
2.	Lungs	CO_2, water vapour through expiratic air.
3.	Skin	Excess water, small amounts of salts, urea in the form of sweat.
4.	Liver	Bile pigments, Urochrome.
5.	Large intestine	Excess salts such as Ca^{++}, Mg^{++} and Fe^{+++}.
6.	Salivary glands	Small amounts of nitrogenous wastes.
7.	Lacrimal glands	Small amounts of nitrogenous wastes, salts etc....

- Kidneys are the main excretory organs in the human body.
- Lungs, Skin, Liver, Large intestine, Salivary glands, Lacrimal glands are the accessory excretory organs.
- Excretory system maintains homeostasis (ionic balance)
- **Human excretory system :-**
- Human excretory system contains a pair of kidneys, a pair of ureters, bladder and urethra.

Kidney :



LOCATION OF KIDNEYS



EXCRETORY SYSTEM

5. COORDINATION
(THE LINKING SYSTEM)

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- All living organisms recognize changes in environment and respond accordingly.
- The ability to react (Respond) to particular stimulus in a particular situation is of great importance for the survival of the organism.

✳ **Stimulus :-** Any detectable change in the environment is called stimulus.

✳ **Response :-** Response is the reaction of a stimulus done by the organism.

- Ex :

Stimulus		Response
Teacher enters into the classroom	-	Students wishing to teacher
Pinching	-	Crying/Scolding
Hungry	-	eating food
Thirsty	-	Drinking water
Watching snake	-	Run away from it
touch the hot object	-	Remove the hand on it
Hearing big sound	-	Close the ears

✳ Responses are classified as
1. Voluntary actions
2. Involuntary actions
3. Reflex actions

✳ 1. Voluntary : Talking, walking, running, drinking, eating . . . . . controlled by cerebrum.
2. Involuntary : Heart beating, secretion of enzymes/hormones, forming of urine, digestion . . . controlled by medulla oblongata and autonomous nervous system.
3. Reflex actions :

✳ When we touch a hot object, we withdraw our hands from it immediately.

✳ When something enters into our nose, we sneeze.

✳ When bright light is focused on our eyes we close our eyes immediately. . . . controlled by spinal card

Coordination :-

✳ All functions/responses in the body are carried out by an effort of several systems which are working together.

✳ The effort of several systems/organs in the body working together for giving responses is called coordination.

✳ Ex :- 1. When we are writing, muscles, nerves, eyes, bones, blood are functioning together in our body.
2. Our eyes, ears, legs, neck should co-ordinate with each other when we are crossing the road.

- Nervous system and Endocrine system are the two systems that control and co-ordinate various organs/systems for giving responses.

Ex : When we saw a snake, we afraid and ran away from that place.

In the above statement there are some sequential events occurs. They are ...

a) Our eye receives the information.
b) Eye sends information to brain through optical nerve.
c) Brain analyse and ordered to muscles of the legs to ran away from that place immediately.
d) When we are afraid internally the rate of heartbeat increased, the breathing rate will be faster, blood pressure increased, externally the hair on the body becomes erect.

In the above situation the action of nervous system is limited. All the changes in the body are carried out under the influence of a chemical change called adrenalin hormone released by adrenal gland.

6. REPRODUCTION
(THE GENERATING SYSTEM)

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✳ **Reproduction :-**

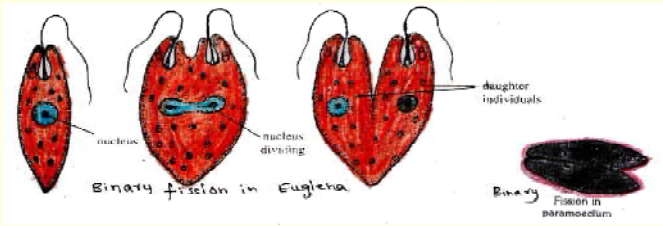
- The ability of an organism to produce a new generation of individuals of the same species is called reproduction.
- Reproduction is necessary for perpetuation and continuation of life.
- Reproduction in a given species is to replace the number of the species that die and also to allow an increase in the total number of the species.
- There are two modes by which animals reproduce. These are
  (i) Sexual reproduction (ii) Asexual reproduction
- In Asexual reproduction, new individuals are produced without the fusion of gametes.
- In Sexual reproduction, fusion of gamates is required to form a new individual.

Sexual Reproduction	Asexual Reproduction
1. Involves one (or) two organisms.	1. Involves a single organism.
2. Male and female gamates are produced.	2. Gamates are not produced.
3. Involves fusion of gamates.	3. No fusion of gamates.
4. Required mitotic and meotic divisions.	4. Required mitotic divisions only.
5. Chance of genetic variations is more.	5. No chance for genetic variaions.
6. Offsprings may have characters of both the parents and some characters which are not present in either of the parents.	6. Offsprings are identical to the parent.
7. Highly useful for natural selection is evolution of species.	7. Not very useful for natural selection in evolution of species.

Asexual Reproduction :- Organisms can reproduce asexually in many ways. They are :
1. Fission 2. Budding 3. Fragmentation 4. Spore formation/sporulation
5. Regeneration 6. Vegetative propagation

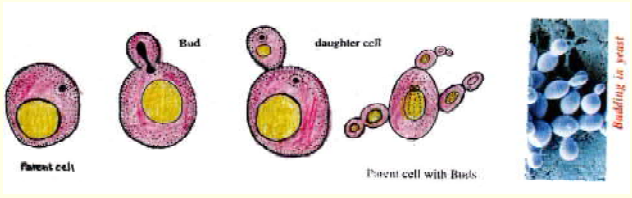
1. Fission :- Single celled organisms, such as Bacteria, Amoeba and Paramoecium, reproduce by splitting into two or more offsprings.

- They split into two by binary fission. When more cells are formed it is called multiple fission.



2. Budding :- A growth on the body as a bud that grows to form nearly identical copy of the parent.

- When the bud totally grows then it saparates from the parent and survives independently.
  Ex :- Yeast, Hydra.



3. Fragmentation :- Fragmentation is common mode of reproduction in algae and fungi.

- In this process, a detached fragment of the fungal hyphae gives rise to a new individual under suitable conditions.

7. CO-ORDINATION IN LIFE PROCESSES

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- Different systems in living organisms like Respiratory System, Digestive System, Blood Circulatory System, Excretory System, Nervous System, Endocrine System etc ... are inbuilt in our body at their specific places and carry out their specific functions in a co-ordinated manner.
- Every process is dependent on others to keep the body in good condition.
- Ex :- Digestive System, Circulatory System, Muscular System, Endocrine System and Nervous System are involved in the 'process of digestion'.

✳ **Hunger Pangs :-**

- Hunger pangs are nothing but hunger generating signals that reach the brain from the stomach due to the secretion of a hormone called Ghrelin.
- When glucose levels in the blood fall or stomach go empty the hormone Ghrelin secreted by the cells of the stomach then hunger pangs start in the stomach.
- Increase in ghrelin levels results in sensation of hunger and motivation to consume food.
- When we feel our stomach is full and there is no need of food, another hormone leptin is secreted that suppresses hunger.

✳ **Taste and smell are closely related :-**

- Taste and smell are closely related. For example when we suffer from severe cough and cold can't make out the difference in tastes of certain food items.
- Smell also increases appetite. So there is a close relation present between taste and smell.

✳ **Taste buds :-**

- We can taste the food materials with the help of taste buds which are present on the tongue.
- When we place any food materials on the tongue, gets dissolved in the saliva secreted by salivary glands in the oral cavity.
- When food substance dissolved in saliva taste buds open and recognise the taste with the help of taste cells which are present in the taste buds.
- If we press the tongue against the palate. We can recognise the taste easily. Why because the food substance is pressed against the opening of the taste buds. Then letting it to reach the taste cells. Then triggering taste signals finally the taste recognised in the brain.
- We can't identify taste when food is very hot because the taste buds become paralyzed due to the overheat.

✳ **Mastication :-**

- Before swallowing the food materials we are grind, chew and shred them with the help of teeth and tongue in oral cavity is called mastication. Thus mouth acts as a munching machine.
- During mastication food size becomes small and sticky due to chew and mixing with saliva.
- Masticated food materials forms into a slurry mass called bolus.
- The 5th cranial nerve has been found to control the movement of muscles in the jaw for mastication.

✳ **Types of teeth and Dental formula :-**

- An adult human has 32 teeth.
- There are 4 types of teeth in man.

8. HEREDITY
(FROM PARENT TO PROGENY)

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Heridity :-

- Transmission of characters from parent to offspring is called Heredity.
- The characteristics of parents transmit from parents to progeny through 'genes' which are present on the chromosomes during the process of reproduction.

Variations :-

- Differences in characters within very closely related groups of organisms are called variations.
- Ex :- 1. Variations in cows are ...
  - White coloured - spotted - Brown - Black
  - Long horns - Short horns - horn less
  - Height - Dwarf - Medium height
  - Long tail - Short tail
  - more milk giving - less milk giving etc . . .

  2. Variations in human beings ...
  - Curly hair - Soft hair
  - Black eyes - Blue eyes
  - Long - Short - Medium
  - Black colour - while colour etc . . .
- Sexual reproduction and errors (mutations) in DNA copying leads to variations in off springs.
- Variations are necessary for organic evolution.
- Variations increase the chance of its survival in the changing environment.

Ex :- Variations in beetle population :-

- Let us consider a group of red beetles lives in bushes on green leaves.
- Crows identify and eat them easily due to red colour.
- So, the population of red beetles is slowly reduced.
- Green beetles are produced from red beetles due to colour variation during sexual reproduction.
- This green colour passes to its offsprings. So that all its progeny are green.
- Crows cannot identify the green beetles on grass.
- But crows can feed the red beetles.
- As a result there are more and more green beetles than red ones.
- The variation of colour in beetle 'green' gave a survival advantage to green beetles than red beetles. It is nothing but natural selection.

Mendelism :-

- Gregor John Mendel was a monk in monastery in Austria.
- In 1857 he started working on the problem of how variations were passed from one generation to the other.
- He did experiments in the monastery garden.
- Mendel had chosen garden pea as materials for his experiments because it has the following reasons :-

  1. Well defined characters 2. Bisexual flowers 3. Predominantly self fertilization
  4. Early hybridization 5. It is a Annual plant
- Mendel had chosen 7 pairs of contrasting characters for his study in pea plants. They are ...

1. Flower colour	:	Purple - White
2. Flower position	:	Axial - Terminal
3. Seed colour	:	Yellow - Green

9. OUR ENVIRONMENT - OUR CONCERN

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✳ **Bio sphere-eco system :-**

- All the life supporting ones on earth are together called Bio-sphere.
- Bio-sphere is a large unit. Hence bio-sphere is divided into smaller units called eco-systems.
- The word ecosystem was first coined by A.G.Transely in 1935.
- Ecosystem is a living place of some different groups of organisms.
- Ex :- grassland ecosystem, forest ecosystem desert ecosystem, pond ecosystem marine ecosystem
- Ecosystem has both abiotic and biotic components.
- All living organisms such as animals, plants and microbes are biotic components.
- Sunlight,soil, air, water, gravity, salts...are the abiotic components.
- In an eco-system living organisms interact among themselves and also with the surrounding abiotic components.
- Biotic components are classified into three types. They are :
  1. Producers 2. Consumers 3. Decomposers
- Producers :- Plants are the only organisms capable of carrying out photosynthesis and producing food to all living organisms in any ecosystem.
  Due to this reason plants are called producers.
- Consumers :- The organisms which depend directly or indirectly on producers for their food requirements are called consumers. These are divided into 3 types.
  a. Primary consumers b. Secondary consumers c. Tertiary (higher order) consumers

a. Primary Consumers :-

✳ They feed/eat plants. ✳ Herbivores are the primary consumers.

✳ Ex : Cow, Goat, Sheep, Giraffe, Zebra, Horse, Donkey, Monkey etc ...

b. Secondary Consumers & Tertiary Consumers:-

✳ The organisms which feed/eat another animals (or) herbivores is called secondary consumers.

✳ Carnivores are the Secondary Consumers and the Tertiary Consumers.

✳ Ex : Lion, Tiger, Eagle, Snake, Frog, Vulture ...

c. Decomposers :-

✳ Some of the organisms in the ecosystem such as Bacteria, fungi are heterotrophic and obtain their nutrients by decomposing the dead bodies of both producers and consumers.

✳ These organisms are a special type of consumers and are called decomposers of the ecosystem.

✳ These are also called as recyclers.

Food chain :-

✳ There is a feeding relationship between plants and animals.

✳ All the organisms in an ecosystem derive energy from food to live.

✳ Food chain shows how energy passed from one organism to another through food.

✳ Food chain consists of producers, primary consumers, secondary consumers and tertiary consumers.

✳ Producers becomes food for primary consumers. Theprimary consumers becomes food for secondary consumers

✳ The arrows between each item in a food chain always point from the food of feeder.

10. NATURAL RESOURCES

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✳ **Natural resources :-** Materials present in large quantities and held in reserve for future use is called a resource. Resources present in nature are called natural resources. Ex : Air, Water, Soil, Plants, Animals, Fossil Fuels, Ores.

Natural resources :- These are two types.

1. Renewable resources 2. Non-renewable resources

1. Renewable resources :- After their use, renewable resources are generated or added back to their source. Hence amount of resource remains constant in nature.

Ex : Air, Water, Sunlight, Forest, Soil.

2. Non-renewable resources :- After their use, non-renewable resources are not generated or not added back to their source. Hence amount of resource remains decrease in nature.

Ex : Ores, Fossil Fuels.

☛ If the rate of use of Renewable resources exceeds the rate of which they are renewed, then even renewable resources become Non-Renewable resources. Ex :- Forest.

We know that trees in forests used for fuel and for construction work in houses and industries for this purpose, trees in the forest are cut and the wood is used. It takes 15-20 years or even more for a tree to grow. It has taken several hundreds of years for an area to become a forest full of trees. If all the trees are cut for human activity in a period of one or two years, there is not enough time for the trees to grow and the whole forest will disappear soon - thus forest becoming a non-renewable resource.

☛ The population of human beings has grown enormously in the past two centuries. Billions of people use up resources quickly as they eat food, build houses, produce goods and burn fuel for transportation and electricity. The continuation of life as we know depends on the careful use of natural resources.

☛ If we use resources carelessly many will be used up and they become as early as empty. If we use wisely and efficiently however, renewable resources will last much longer. Through conservation, people can reduce waste and manage natural resources wisely.

FOREST

✳ Forests serve as lungs for the world.

✳ They provide us innumerable products such as wood, medicine plants, fruits, honey, bamboo sticks ...

✳ Forests are a rich habitat for plants and animals.

✳ Deforestation destroys wild life.

✳ Increase soil erosion and decrease rainfall.

✳ Due to using wood as firewood greenhouses gases released into atmosphere, contributing to global warming.

✳ De-forestation also harms the people who rely on forests for their survival, hunting and gathering harvesting forest products.

✳ Sustainable forestry methods :-

☛ Sustainable forestry practices are critical for ensuring resources well into the future.

1. Harvesting with natural regeneration.
2. Avoiding certain logging techniques, such as removing all the high-value trees (or) all the largest trees from a forest.
3. Trees can also be conserved if consumers recycle people in China and Mexico reuse much of their waste paper including writing paper, wrapping paper and cardboard.
4. If half the world's paper were recycled, much of the worldwide demand for new paper would be fulfilled, saving many of the earth's trees.

ENVIRONMENTAL SCIENCE

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A. GLOBAL WARMING

1. Greenhouse gases / Earth heating Gases
   a) Carbon dioxide (CO_2)
   b) Nitrogen dioxide (NO_2)
   c) Chlorofluorocarbons (CFC)
   d) Hydrocarbons
   e) Methane (CH_4)
2. Excess presence of these gases in the atmosphere causes global warming.
3. These gases are released into atmosphere from factories, chemical industries, air conditions (AC), refrigerators, burning of waste materials (papers, plastic, tires etc.,)
4. Precautions :
   a) Reducing the use of incandescent bulbs.
   b) Minimize the time period of usage of refrigerators.
   c) Do not burn the waste, turn into compost manure by using earthworms.
   d) Minimize the usage of fossil fuels.
   e) Stop deforestation, start plantation.

B. SAVIORS OF OUR ENVIRONMENT

1. Environmentalism includes
   a) Conservation of natural resources
   b) Prevention of Pollution
   c) Sustainable use of land
2. Our environmentalists
   a) Sundarlal Bahuguna - CHIPKO movement and Anti - Tehri dam movement
   b) Medhapatkar - Narmada bachao movement
3. Environment - our concern
   a) Saving a tree from cutting
   b) Growing of trees /plants in the school compound
   c) Giving medical assistance to a suffering dog or a bird.
   d) Keep surrounding clean and green.
   e) Preventing entering of waste materials into the pond or pool etc. are part of environmental movement.

C. PARTICULATE POLLUTANTS IN AIR :

1. Solid particles and liquid droplets present in air are called particulate pollutants.
   Example :- Pollen grains, Spores, Dust in smoke and vehicular exhaust, Fly ash, Coal dust, Cement and Mist etc.
2. Problems :
   a) Reduce visibility
   b) Various respiratory diseases (asthma)
   c) Increases global warming
   d) Allergie

D. VACCINATION :

1. Vaccination protect ourselves from Diphtheria, Whooping cough, Tetanus, Cholera, Hepatitis, Polio.
2. By using vaccination we eradicate small fox.

DEFINITIONS
(All chapters important Definitions)

All chapters important Definitions pl.scan QR

1. Photosynthesis :- ✳ Carbohydrates are synthesized in chloroplasts from CO_2 and water in the presence of sunlight. This is called photosynthesis.

$$6CO_2 + 12H_2O \xrightarrow[chlorophyll]{light} C_6H_{12}O_6 + 6O_2 + 6H_2O$$

2. Photolysis/Hill's reaction :- Photo = light lysis = splitting

✳ Activated chlorophyll splits the water molecule into ions.

$$H_2O \rightarrow H^+ + OH^-$$

✳ It is discovered by scientist hill. Hence it is called as Hill's reaction.

3. Malnutrition :-

✳ Eating of food that does not contain sufficient nutrients is called malnutrition.

Ex :- Protein malnutrition - Kwashiorkor
Protein calorie malnutrition - marasmus

4. Arteries :-

✳ The blood vessels that carry blood from heart to body parts are called arteries.

5. Veins :-

✳ The blood vessels that carry blood from body parts to heart are called veins.

6. Blood pressure :-

✳ Blood flows in blood vessels with a specific pressure called blood pressure.

✳ Normal blood pressure is $\frac{120}{80}$ mm of Hg.

✳ Blood pressure measuring device is sphygmomanometer.

7. Cardiac cycle :-

✳ The sequential events which occur cyclically in heart is called cardiac cycle.

8. Excretion :-

✳ The life process which removes waste materials from the body is called excretion.

9. Uremia :-

✳ If kidneys stop working completely, or body is filled with extra water and waste products, this condition is called uremic.

10. Dialysis :-

✳ The process of dialysis is used to filter the blood of a person who suffers from uremia.

11. Sensory Nerve (Afferent nerve) :-

✳ Nerve that carries information from sense organ to spinal cord (or) brain is called sensory nerve.

12. Motor Nerve (Efferent nerve) :-

✳ Nerve that carries information from the brain (or) spinal cord to effector organ is called motor nerve.

13. Association Nerve :-

✳ Nerve that links together the sensory and motor nerve is called association nerve.

14. Phototropism :-

✳ Photo = light, tropism = movement

✳ Shoots of a plant always grow towards the light. This type of response is called phototropism.

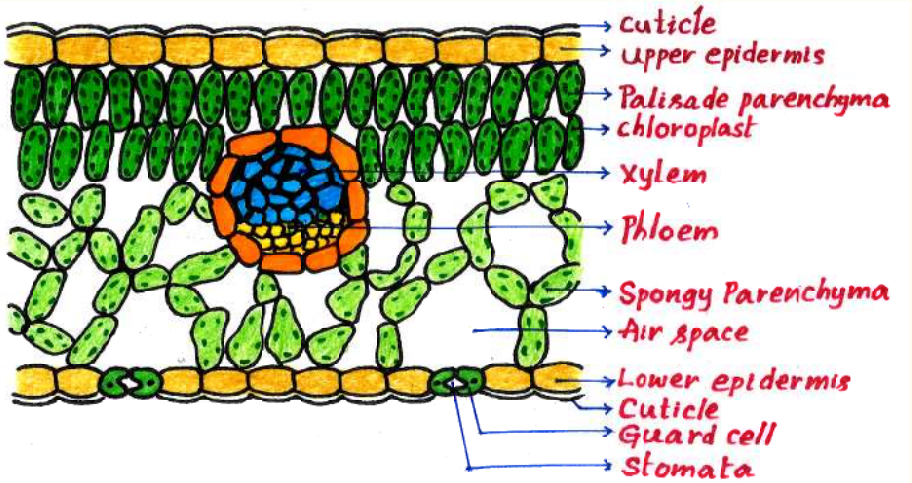
✳ Growth of a plant near a window, bend towards sunlight due to phototropism

15. Geotropism :-

✳ Geo = gravitational force, tropism = movement

✳ Roots of a plant always grow downwards. This type of response is called Geotropism.

TRANSVERSE SECTION OF LEAF



Internal structure of leaf

1. Upper and lower surface of the leaf contain a single layered upper epidermis and lower epidermis.
2. Both the upper and lower epidermis are covered with a thin layer called Cuticle.
3. Palisade parenchyma arranged towards upper epidermis.
4. Spongy parenchyma arranged towards lower epidermis.
5. Air spaces are present in Parenchyma spongy.
6. Chloroplasts are present in both palisade and spongy parenchyma. But the number of chloroplasts are more in palisade parenchyma than spongy parenchyma.
7. Vascular bundles are present. It contains xylem and phloem.
8. Stomata are present in lower epidermis.

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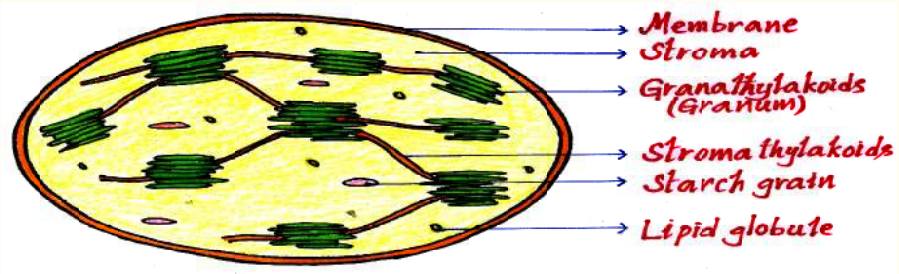
CHLOROPLAST

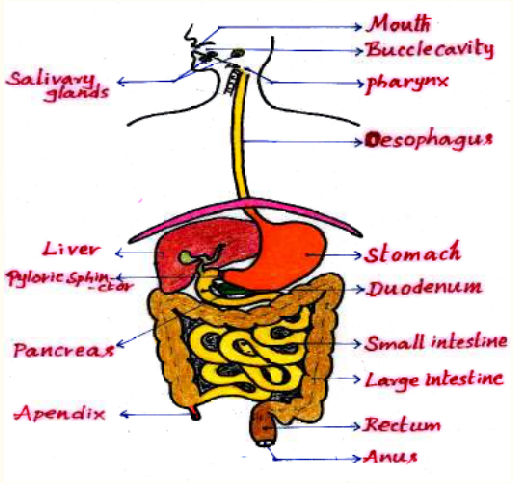


Structure of chloroplast

1. In 1883, Julius Van Sachs discovered the chloroplast in leaf cell.
2. Chloroplasts are present in mesophyll of leaves and other greeny parts of the plant.
3. Typical chloroplasts are in disc shaped.
4. They are green in colour due to the presence of chlorophyll.
5. They are covered by a double layered membrane.
6. They are filled with colourless fluid called Stroma.
7. Stalks of thylakoid membranes are located in stroma are called Granum or Grana thylakoids.
8. Grana thylakoids are connected by Stroma thylakoids.
9. Chlorophyll and accessory pigments are located in Grana thylakoids

RAJU'S NATURAL SCIENCE ACADEMY

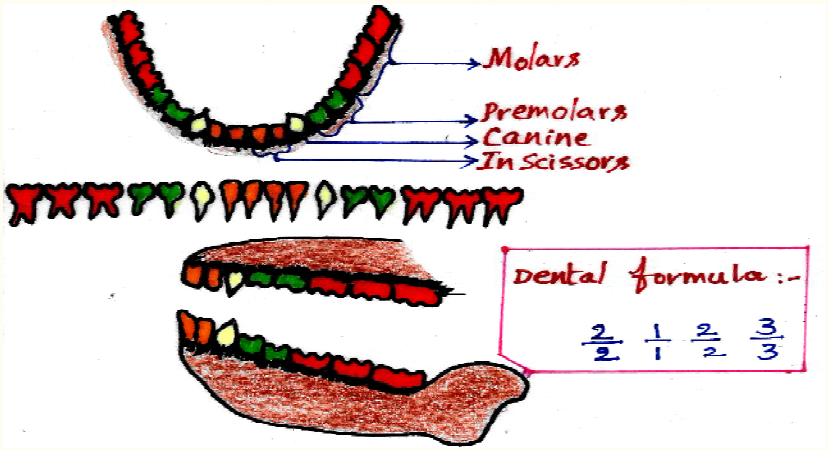
DIGESTIVE SYSTEM



Human Digestive System

1. The group of organs which are participate in digestion is called Digestive system.
2. Digestive system contains alimentary canal and digestive glands.
3. The Alimentary canal is a long tube starts from mouth and ends with anus.
4. Parts of alimentary canal are :
   1. Mouth 2. Oral cavity / Buccal cavity 3. Pharynx
   4. Oesophagus 5. Stomach 6. Duodenum
   7. Small intestine 8. Large intestine 9. Rectum 10. Anus.
5. Five types of digestive glands are associated with alimentary canal. They are :1. Salivary glands 2. Gastric glands 3. Liver
   4. Pancreas 5. Intestinal glands.
6. The large complex food molecules are break down into small simple molecules in the alimentary canal with the help of enzymes is called "digestion".

DENTITION



RAJU'S NATURAL SCIENCE ACADEMY

Dentition

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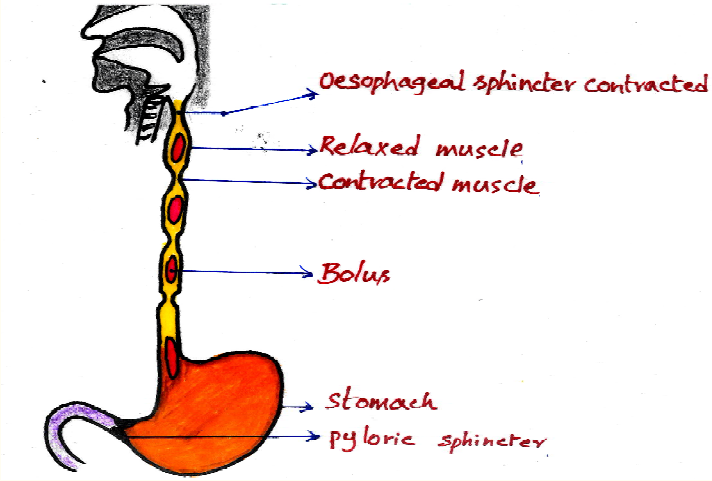
1. An adult human has 32 teeth.
2. There are 4 types of teeth in human beings.
   1. Inscissors - 8 - biting the food to make small pieces.
   2. Canines - 4 - Piercing or tearing the food.
   3. Premolars – 8
   4. Molars – 12

   } grinding the food materials
3. Dental formula $\frac{2}{2}, \frac{1}{1}, \frac{2}{2}, \frac{3}{3}$.

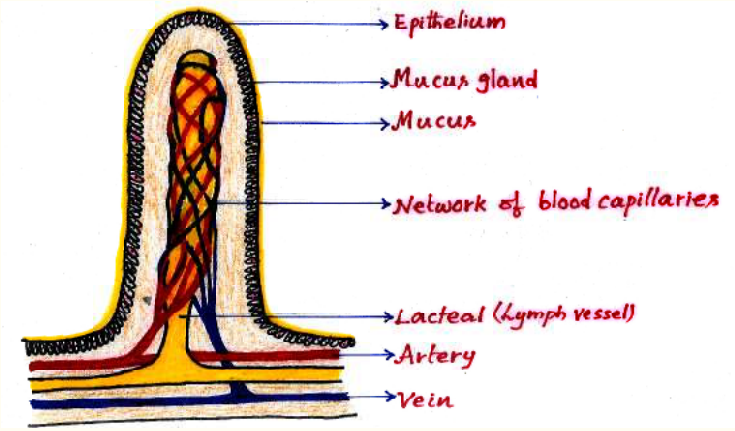
PERISTALTIC MOVEMENT OF BOLUS



Peristalsis

1. Oesophagus is a long tube upper end connects to pharynx and lower end connects to stomach.
2. It is muscular and elastic.
3. When the food enters into oesophagus, the muscles present in its wall contract and relax alternately.
4. Due to this wave like movements are producing.
5. These wave like movements are called Peristaltic movements. This process is called peristalsis.
6. These movements help in pushing the food down into the stomach.

VILLI



Villi

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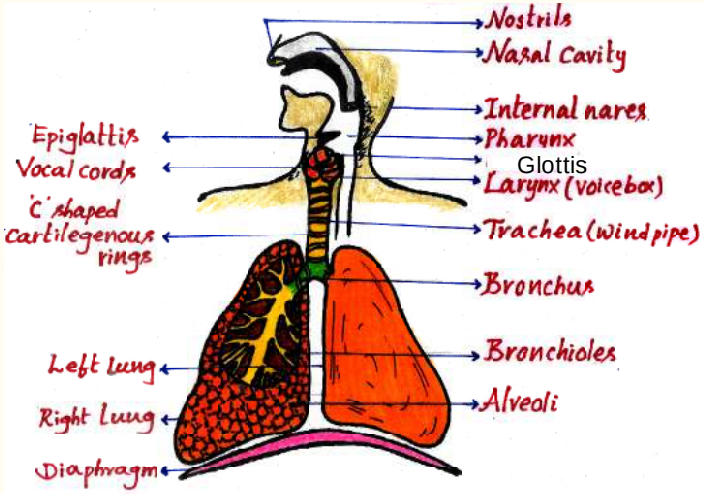
1. Finger like projections present in the inner walls of the small intestine are called Villi.
2. Blood vessels and Lymph vessels are present to form a network in villi.
3. They absorb the digested food into the blood.
4. Due to the presence of villi surface of the small intestine increase.
5. It helps rapid absorptiion of digestive food materials.

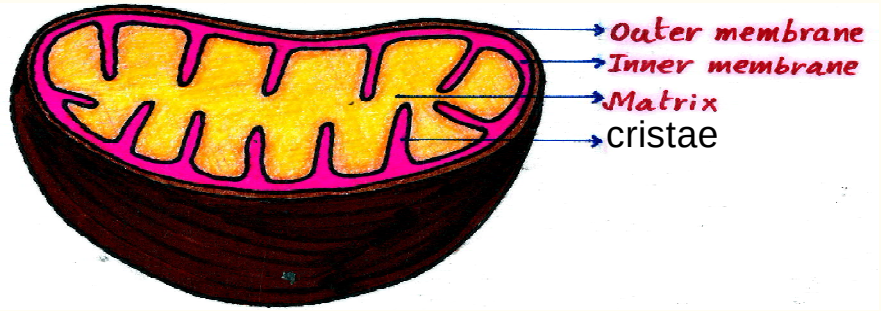
RESPIRATORY SYSTEM



Respiratory System

1. The group of organs which are participate in breathing or external respiration is called respiratory system.
2. The parts of Respiratory System are :
   1. Nostrils 2. Nosal cavity 3. internal nares 4. Pharynx 5. Glottis 6. Larynx (voice box) 7. Trachea 8. Brochi 9. Bronchioles 10. Alveoli
3. One pair of lungs are present in chest cavity.
4. These are spongy and elastic.
5. These are surrounded by two layers called Pleura.
6. Right lung is slight larger than the left lung.
7. Each lung contains millions of small chambers called alveoli.
8. Exchange of gases between lungs and blood occurs in alveoli.
9. Oxygen (O_2) enters into the blood from lungs while carbondioxide (CO_2) enters into the lungs from blood through the walls of alveoli.

MITOCHONDRIA



RAJU'S NATURAL SCIENCE ACADEMY

Strucutre of MITOCHONDRIA

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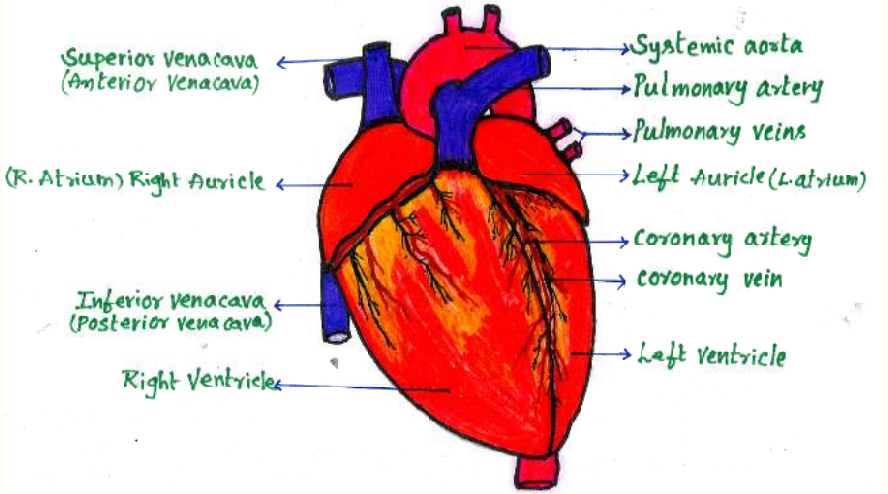
1. Mitochondria are small, spherical or cylindrical organelle are present in the cytoplasm of the cell.
2. Generally a mitochondria is 2-8 micron long and about 0.5 micron wide.
3. It is surrounded by a double layered membrane.
4. Mitochondria are filled with matrix.
5. Outer membrane is smooth. Inner membrane has several folds called Cristae.
6. Mitochondria are responsible for cellular respiration.
7. During Respiration energy produced and stored in mitochondria. So, it is called as "Power house of the cell".

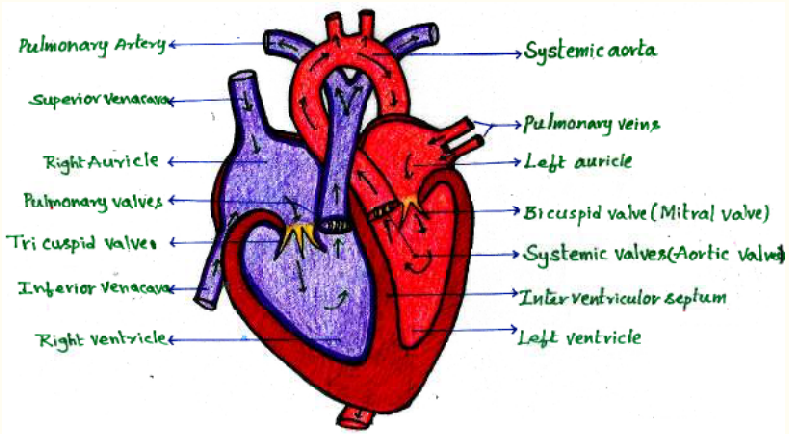
HEART



External features of HEART

1. Heart is situated towards the left side of chest cavity in between two lungs.
2. It is made up of cardiac muscle.
3. It is the size of the fist of the person.
4. It is a hollow organ.
5. It is conical shaped organ.
6. Two deep grooves are visible on the outside of the heart. One verticle and one horizontal.
7. These grooves indicate that the heart is internally divided into four chambers, that is two auricles and two ventricles.
8. It is surrounded by a double layered, thin sac called Pericardium. It protects the heart from physical shocks.
9. Coronary artery supplies O_2 and glucose to the wall of heart Coronary vein receives CO_2 and waste materials.

INTERNAL STRUTURE OF HEART



RAJU'S NATURAL SCIENCE ACADEMY

Internal Structure of HEART

1. Heart has four chambers. i.e.,Two upper - Auricles.
   Two lower - Ventricles.
2. Right and left auricles are seperated by inter auricular septum.
3. Right and left ventricles are seperated by inter ventricular spetum.
4. The walls of ventricles are thicker than the walls of auricles.
5. Right auricle is larger than left auricle.
6. Left ventricle is larger than right ventricle.
7. Right auricle opens into right ventricle through right auriculo ventricular aperture.
8. Left auricle opens into left ventricle through left auriculo-ventricular aperture.
9. Superior and Inferior venacavas are open into the right auricle.
10. Two pulmonary veins are open into the left auricle.
11. Pulmonary artery originates in the right ventricle.
12. Systemic aorta originates in the left ventricle.
13. Tri cuspid valve is located at Right auriculo ventricular pore.
14. Bi-cuspid valve is located at left auriculo ventricular pore.(Mitral valve)

How to draw
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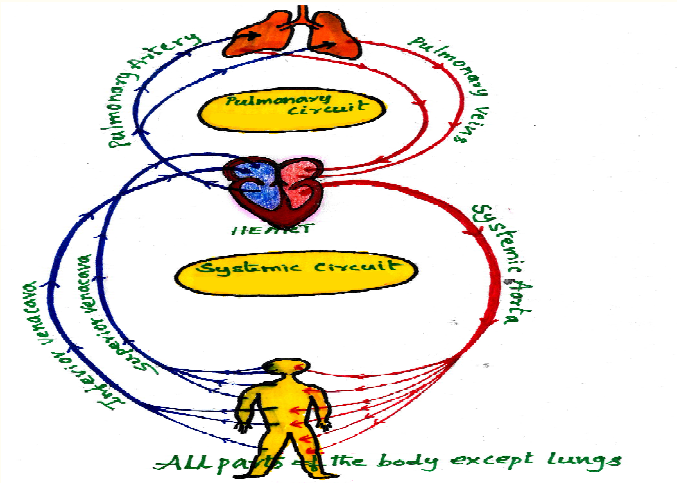
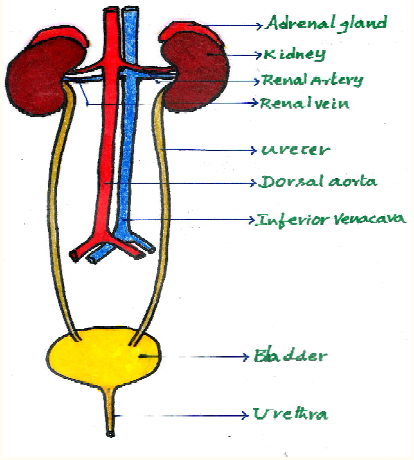
HUMAN BLOOD CIRCULATORY SYSTEM (DOUBLE CIRCUIT CIRCULATOR SYSTEM)



Blood circulation in human beings (Double circuit circulatory system)

1. In circularity system blood flows continuously in blood vessels with the help of heart through out in the body.
2. Blood flows through the heart twice for completing one circulation. So, it is called as Double Circuit Circulation.
3. Oxygenated blood flows from lungs to left auricle of the heart through two pulmonary veins.
4. Then oxygenated blood flows from left auricle into left ventricle through left auriculo ventricular operture.
5. Then oxygenated blood flows from left ventricle into all parts of the body except lungs through systemic aorta.
6. Superior vena cava & Inferior venacava are collect the de-oxygenated blood from all parts of the body except lungs and sent into right auricle of the heart.
7. These de-oxygenated blood enters from right auricle into right ventricle through right auriculo-ventricular aperture.
8. The De-oxygenated blood sends from right ventricle into lungs through pulmonary artery for oxygenation.

EXCRETORY SYSTEM



RAJU'S NATURAL SCIENCE ACADEMY

Excretory system

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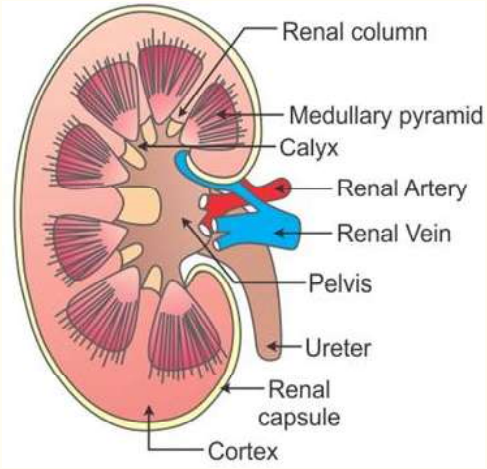
1. Human Excretory system contains a pair of kidneys, a pair of ureters, Bladder and Urethra.
2. One pair of kidneys are attached to the dorsal body wall, on either side of vertebral column in the abdominal cavity.
3. Kidneys are bean shaped, reddish brown organ in colour.
4. It is 10cm in length, 5-6 cm in breadth and 4cm in thickness.
5. Outer margin of kidney is convex and inner margin is concave.
6. The notch present in the inner margin is called hilus.
7. Through hilus renal artery enters into the kidney, while Renal vein and ureter are come out from the kidney.
8. There are a pair of whitish, narrow and muscular tubes of 30cm of length are come out from each kidney known as Ureters.
9. It moves downward and opens into the urinary bladder.
10. Urinary bladder stores urine bought by two ureters.
11. It opens into outside through urethra.
12. It is a tube that takes urine from urinary bladder to outside.

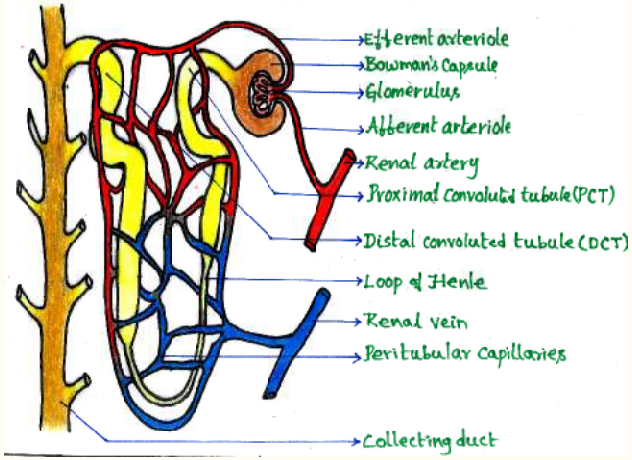
LONGITUDINAL SECTION OF KIDNEY



Internal Structure of KIDNEY

1. L.S of kidney shows two distinct regions.
   They are : 1. Cortex
   2. Medulla
2. The outer region of kidney is deep red in colour, called Cortex.
3. The inner region of kidney is light red in colour, called Medulla.
4. Each kidney is made up of about 1.3-1.8 millions of microscopic and thin tubular, functional units called Nephrons or Uriniferous Tubules.
5. Nephrons are responsible for urine formation.
   Hence those reasons “Nephrons are the structural and functional unit of the kidney.

NEPHRON



RAJU'S NATURAL SCIENCE ACADEMY

Structure of Nephron

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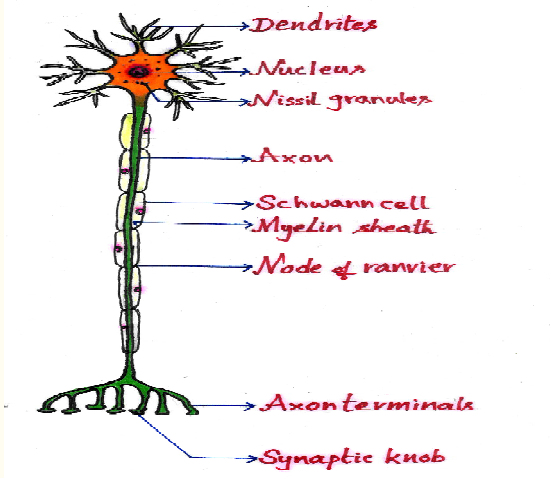
1. Nephron is the structural and functional unit of the kidney.
2. Each kidney contains about 1.3 to 1.8 millions of nephrons.
3. Each Nephron contains two parts. They are :
   1. Malpighian body 2. Renal tubule/Nephric duct
4. Malpighian body contains two parts. They are :
   1. Bowman’s capsule 2. Glomerulus
5. Bowman’s capsule is a two layered cup with space in between two layers.
6. Inside the cup of Bowman’s capsule, there is a bunch of capillaries is called glomerulus.
7. Glomerulus develops from afferent arteriole and it gives rise to efferent arteriole.
8. The diametre of efferent arteriole is less than the afferent arteriole.
9. Renal tubule arises from Bowman’s capsule.
10. It contains three parts. They are :1. PCT [Proximal Convoluted tubule]
    2. Loop of Henle 3. DCT [Distal Convoluted tubule]
11. PCT is the first part of Renal tubule arises from Bowman’s capsule.
12. Henle loop is ‘U’ shaped present between PCT and DCT.
13. DCT opens into collecting tube.

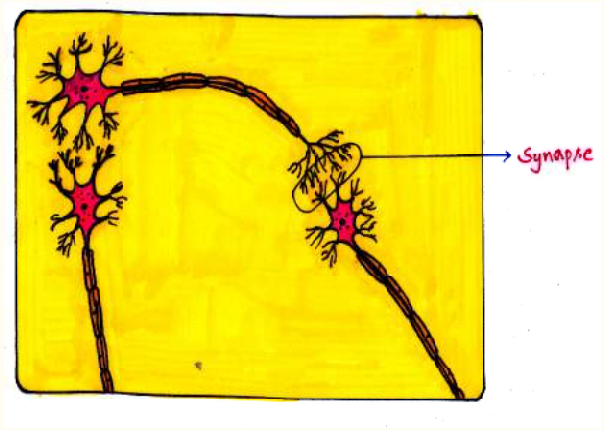
NEURON NERVE CELL



Structure of Neuron

1. Neuron is the structural and functional unit of nervous system.
2. Neuron contains three distinct parts. They are :
   1. Cell body / cyton / soma 2. Dendrites 3. Axon
3. Cell body has a large nucleus and cytoplasm.
4. The cytoplasm contains granular structures called Nissal Granules.
5. There are some projections arised from the cell body are called Dendrites.
6. Dendrites are short, Dendrites branched and more in number.
7. Dendrites are responsible for receiving the information from another neuron.
8. One projection of cyton is some what longer than remaining projection is called Axon.
9. Axons of some nerve cells are covered with myelin sheath.
10. The myelin sheath is made up of schwann cells chiefly consists of flatty materials.
11. Myelin sheath is interrupted at regular intervals called nodes of ranvier.
12. Axon is responsible for carry out the information from the cell body.
13. Axon ends with Nerve terminals.

SYNAPSE



Structure of SYNAPSE

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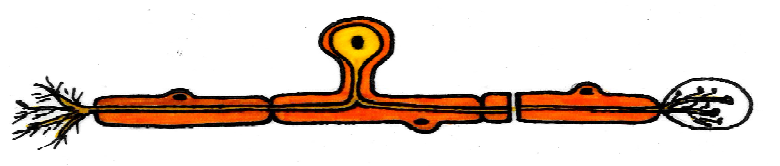
1. Synapse is the functional region of contact between two neurons, where information from one neuron is transmitted to another neuron.
2. It is a minute gap yet information is passed from one neuron to the other through these gap either in the form of chemical or electrical signal or both.

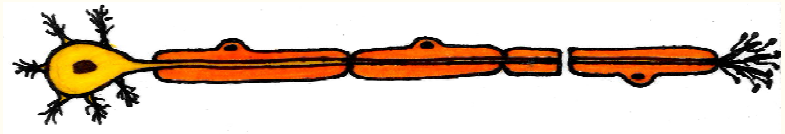
RAJU'S NATURAL SCIENCE ACADEMY

TYPES OF NEURONS

AFFERENT / SENSORY NEURON



EFFERENT / MOTOR NEURON



Types of Nerves

1. On the basis of path ways followed, Nerves are classified mainly into three types. They are :
   1. Sensory Nerve / Afferent Nerve
   2. Motor Nerve / Efferent Nerve
   3. Association Nerve

1. Sensory Nerve :-

Nerves that carry impulses/information from the sense organs (or) Receptors to spinal cord/brain are called sensory nerves.

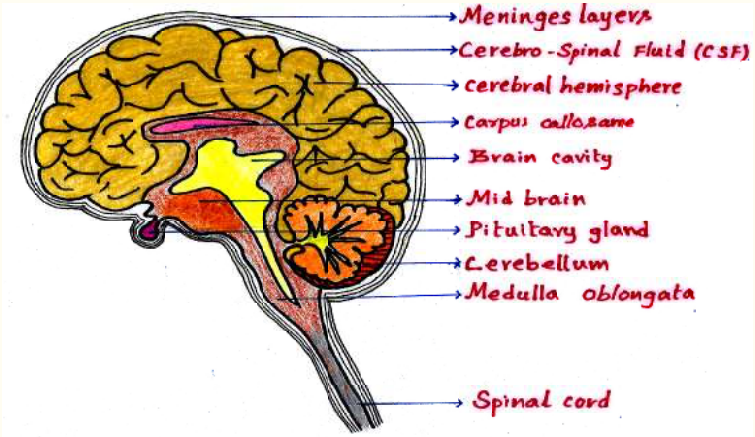
2. Motor Nerve :-

Nerves that carry impulses/information from the brain (or) spinal cord to effector organs are called Motor nerves.

3. Assosiation Nerve :-

Nerves that link together the sensory and motor nerves are called Assosiation nerves.

Structure of BRAIN

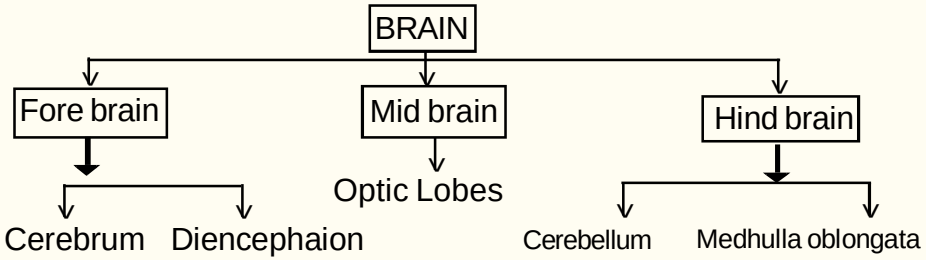


RAJU'S NATURAL SCIENCE ACADEMY

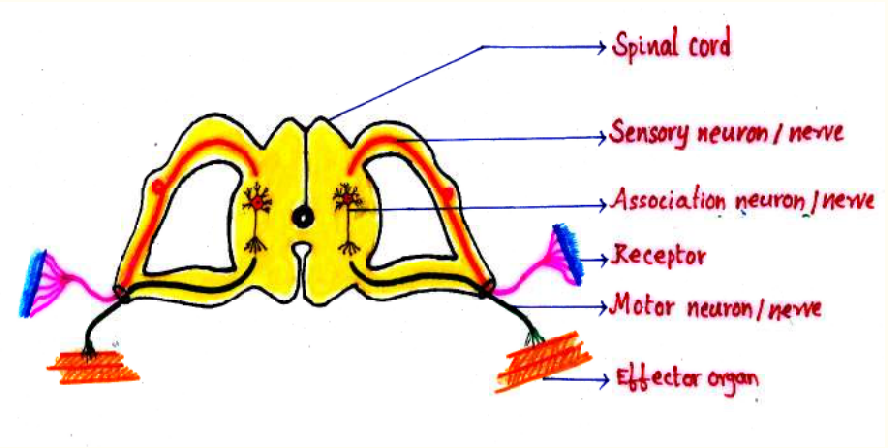
Structure of BRAIN

How to draw pl. scan QR

1. Brain is present in the hard bony box like structure called Cranium.
2. It is covered by three layers called the meninges. The Meninges are continuous and cover the spinal cord as well.
3. The space between the inner layers is filled with Cerebro-Spinal Fluid (C.S.F.)
4. Brain contains three divisions. They are :



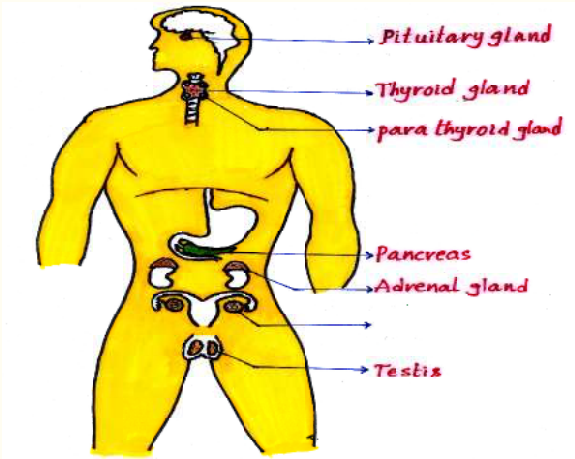
REFLEX ARC



Reflex actions - reflex arc

1. Reflex actions are fast, immediate automatic and involountary responses of the body.
2. Spinal cord plays a major role in reflex action, Brain doesn't involved in the execution several reflexes.
3. Ex : 1. When we touch a hot object immediately with draw our hand on it.
   2. We close our eyes when bright light is focused on our eyes.
4. The structural and functional unit that carries out reflex action is called a reflex arc.
   1. Receptor :- Receives infromation and generates impulses.
   2. Sensory Nerve :- Carries information from the receptor to the association neuron in the spinal cord.
   3. Association Nerve :- Analyse the information and generates responses.
   4. Motor Nerve :- Carries information from the spinal cord to the effector organ.
   5. Effector organ :- Receives the information and shows the appropriate responses.

ENDOCRINE SYSTEM



RAJU'S NATURAL SCIENCE ACADEMY

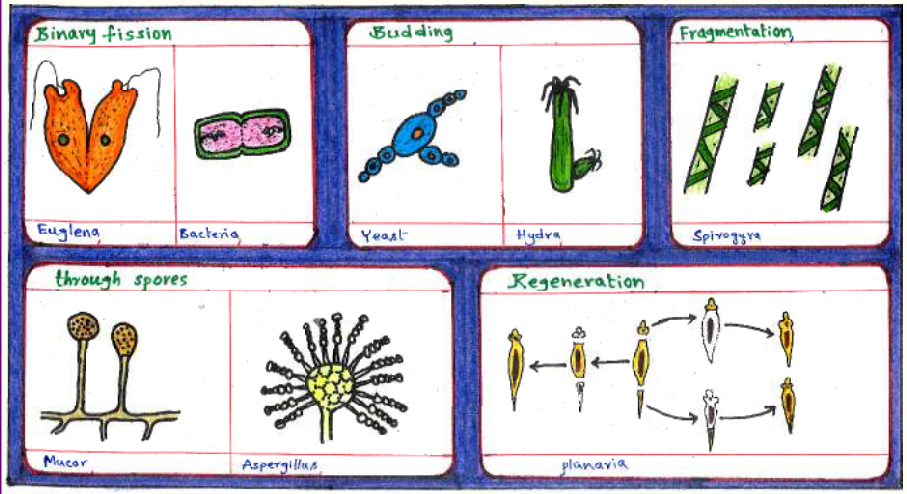
Endocrine system

How to draw pl. scan QR

1. Endocrine system consists Endocrine glands.
2. These glands secrete hormones directly into the blood. Blood carries the hormones into where it is necessary.
3. These glands do not have ducts. So these are called as ductless glands.
4. There are 6 endocrine glands in our body. They are :

1. Pituitary gland	-	Somatotrophin Thyrotrophin Gonado trophin
2. Thyroid	-	Thyroxin
3. Parathyroid	-	Para tharmone
4. Pancreas	-	Insulin, Glucagon
5. Adrenal	-	Adrenalin
6. Testis	-	Testosterone
7. Ovary	-	Estrogen, Progesteron

ASEXUAL REPRODUCTIVE METHODS



Asexual Reproductive Methods

1. The ability of an organism to produce a new generation of individuals of the same speacies is called Reproduction.
2. In Asexual reproduction, new individuals are produced without the fusion of gametes.
3. Organisms can reproduce asexually in many ways. They are :

1. Fission : Single celled organisms such as bacteria, Amoeba, Eugleena and Paramoecium, reproduce by splitting into two or more off springs.

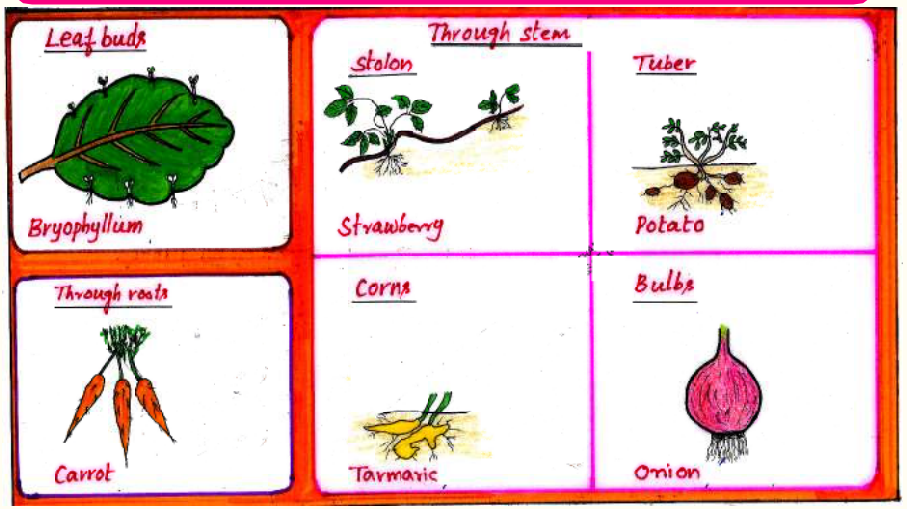
2. Budding : 1. A growth on a body (bud) that grows to form nearly identical copy of the parent.
2. When the bud totally grows then it seperates from the parent and survives individual. Ex : Yeast, Hydra.

3. Fragmentation : In this process a detached fragment of fungal hyphae gives rise to new individual under suitable conditions. Ex : Algae, Fungi

4. Sporulation : 1. Most of the fungi like Rhizopus, Mucor etc. Bacteria and non-flowering plant such as fern and moss reproduce by the method of spore formation.
2. A spore is a small microscopic, unicellular, reproductive unit. Ex : Asperigillus, Mucor, Moss, Fern.

5. Regeneration : If the individual is somehow cut or broken up into many pieces, these pieces grow into seperate individuals. Ex : Planaria.

NATURAL VEGETATIVE PROPAGATION METHODS

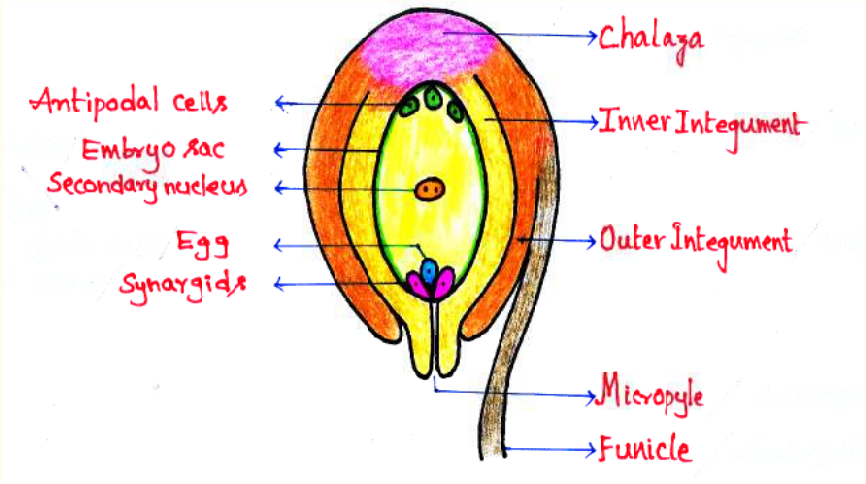


Natural Vegetative Propagations

How to draw pl. scan QR

1. Several plants may be grown from vegetative parts like stems, roots, leaves etc and is called vegetative propagation.
2. Vegetative propagation may be natural or man made.
3. 1. Leaves / Leaf buds - Bryophyllum
   2. Stems - Stolons - Vallisneria, Strawberry
      Bulbs - Onion (Alliumsepa)
      Corns - Colacasia
      Tuber - Potato
   3. Roots - Dahlia, Radish, Carrot.

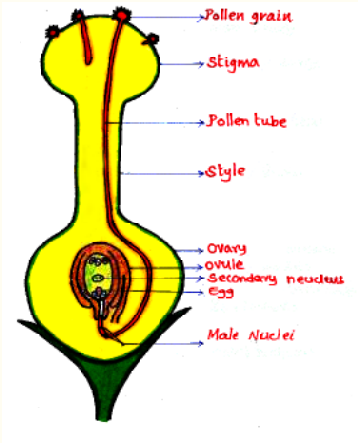
OVULE



Structure of Ovule

1. An ovule is an egg-shaped structure attached by a stalk to the inner side of the ovary.
2. Depending upon the species of plant involved, an ovary may have one, two, several or even hundreds of ovules.
3. In the centre of the each ovule contains a microscopic embryo sac.
4. It surrounded by two integument : They are
   1. Outer integument 2. Inner integument
5. The basal part of the ovule is called chalaza from chalaza the two integuments are airse.
6. The two integuments leave a small pore opposite side of the chalaza is called Micropyle.
7. They are total of 7 cells are arranged in three groups of embryo sac. They are :
   1 egg, 2 synergids/helper cells
   1 secondary nucleus, 3 Antipodal cells.
8. All cells in embryo sac are in haploid state (n) except secondary nucleus. It is in diploid state (2n).

Process of FERTILIZATION in Plants



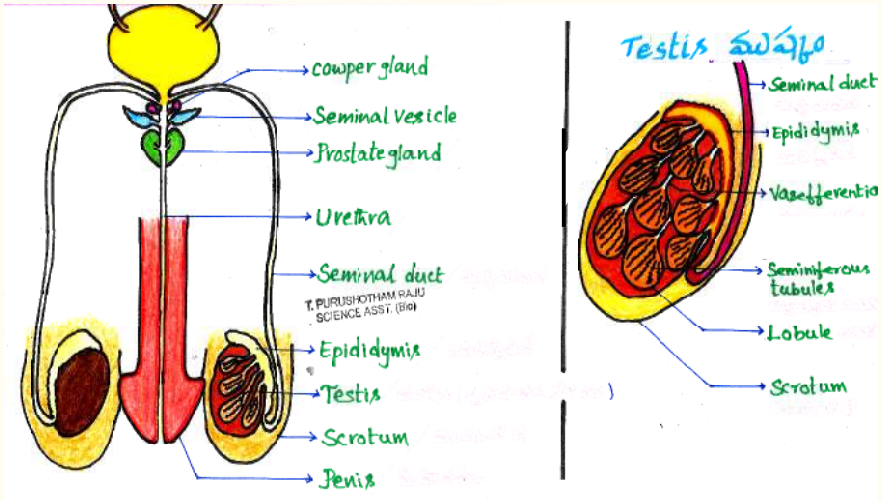
RAJU'S NATURAL SCIENCE ACADEMY

DOUBLE Fertilization in plants

How to draw pl. scan QR

1. Fusion of male and female gamates is called Fertilization.
2. For Fertilization, pollen grains have to reach the surface of the stigma is called Pollination.
3. Cells on the surface of the stigma secrets a sticky nutrient fluid contains sugar and other substances.
4. This will help the pollengrains to germinate. Then it forms pollen tube.
5. Pollen tube travels through style and reaches ovary and enters into ovule through micropyle.
6. Pollen tube contains two male nuclei. These are enter into embryo sac.
7. One male nucleus fuses with egg to form a diploid (2n) cell called Zygote.
8. The other male nucleus fuses with secondary nucleus to form a triploid (3n) endo spermal nucleus.
9. After fertilization ovary is converted into a fruit and the ovules into seed.

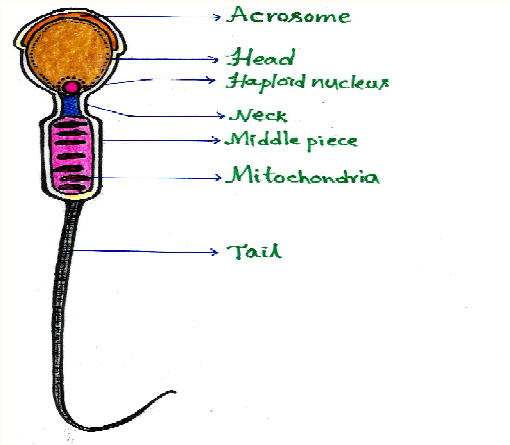
MALE REPRODUCTIVE SYSTEM



Male reproductive system

1. In testis males, two testies are located in pocket like structure, outside the body wall is called scrotum (or) scrotal sac.
2. Each testis has several lobules.
3. Each tobule contains several seminiferous tubules.
4. The spermatozoa produced in very large number in that tubules.
5. Vas-efferentia collects spermatozoa from the tubules.
6. Vas-efferentia forms epididymis. Here sperms are stored temporarily and moved into vasdeferens then to urethra of penis and sends out of the body.
7. There are 5 accessory glands include in M.R.P. They are 1 prostrate, 2 seminal vesicles and 2 cowper's glands.
8. These accessory glands secrete a fluid called Semen. This provides nutrients for sperm to keep alive and helps as a medium for the movement of the sperms.

SPERM CELL

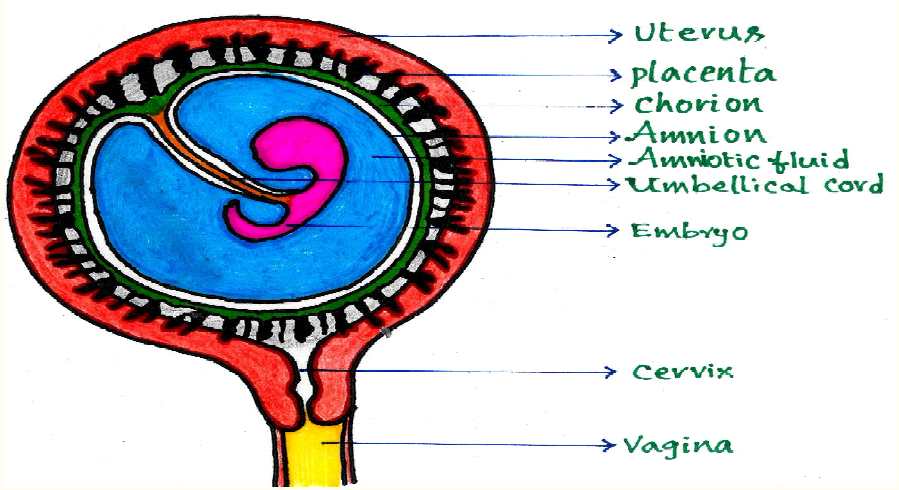


Structure of Sperm cell

How to draw
pl. scan QR

1. Sperms are male gametes.
2. They are produced in male gonads called Testis.
3. They are micro-scopic and motile.
4. They have an oval head piece, a neck, a middle piece and a tail.
5. Head piece consists a large haploid nucleus. It carries the characters from parent to offspring.
6. A sac like structure called Acrosome is present on the head.
7. Neck is short, it connects head with middle piece.
8. Middle piece contains several Mitochondria which produce energy required for the movements of sperm.
9. A long tail attached to the middle piece. It helps in the swimming of sperm to reach the ovum.

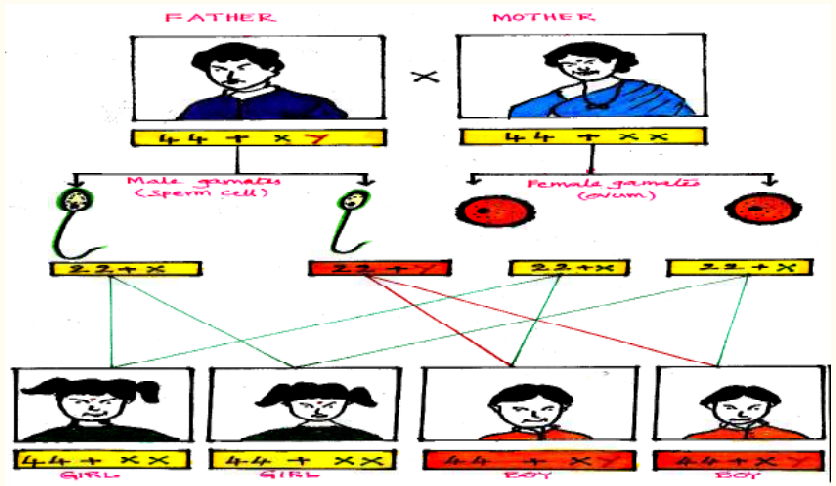
HUMAN EMBRYO



Human embryo development

1. Due to the fertilization zygote forms in follopian tube.
2. Zygote travells from fallopian tube to uterus.
3. At the time of travelling zygote undergoes division and forms as Blastocoel.
4. Further development of the embryo occurs in the uterus.
5. From the third month of pregnancy, the embryo is called foetus.
6. The growing embryo forms two membranes - chorion, Amnion, Allantois and yock sac.
7. Amnion forms grows as a sac like structure around the embryo.
8. The space between the Amnion and embryo is filled with a fluid called amniotic fluid. It gives protection to the embryo against mechanical shocks.
9. Chorion establishes connection with the walls of uterus for supply of nutrients to the embryo and for removal of wastes from the embryo is called Placenta.
10. Placenta is a tissue formed by the cells from the embryo and the mother. It is formed at around 12 weeks of pregnancy.
11. Embryo receives all the required nutrients and oxygen for its metabolism from the mother through umbilical cord.
12. Umbilical cord is a tube like structure, which originates from the digestive canal of the embryo.

SEX DETERMINATION IN HUMAN BEINGS



Sex determination in human beings

How to draw pl. scan QR

1. Each human cell contains 23 pairs of chromosomes.
2. Out of 23 pairs 22 pairs are autosomes, 1 pair is allosomes.
3. Allosomes are two types one is 'X' and other is 'Y'.
4. These two chromosomes determine the sex of an individual.
5. Females have two 'X' chromosomes in their cells, while males have one 'X' and one 'Y'. In females = Allosmes - 'XX', in males = Allosomes - 'XY'.
6. All the gamates produced by a woman have one 'X' chromosome.
7. But the gamates produced by a man are two types. One with 'X' chromosome and the other with 'Y'.
8. If a sperm which is having 'Y' chromosome is fertilizes the ovum, zygote contains 'XY' chromosomes. Hence the zygote will be develops as a boy.
9. If a sperm which is having 'X' chromosome is fertilizes the ovum, zygote having 'XY' chromosome. Hence the zygote will be developing as a girl.
10. So, the sex determination of the baby depends on the sex chromosome carried by the sperm.
11. So, male is the responsible for sex determination of the baby.

1. TEST THE PRESENCE OF STARCH IN LEAVES

original preparation lab activity pl. scan QR

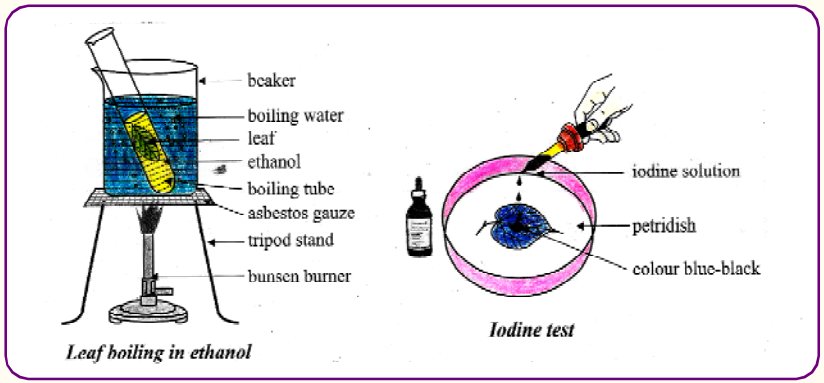
AIM

To test the presence of starch in leaves.

APPARATUS

1. Beaker 2. Test tube 3. Water
4. Methylated spirit (Ethanol) 5. Tripod stand
6. Asbetos gauze 7. Bunsen burner 8. Petridish
9. Iodine solution 10. Leaf 11. Dropper

DIAGRAM



PROCEDURE

1. Take a leaf of potted plant.
2. Boil the leaf in methylated spirt over a water bath.
   (if we boil the leaf in methylated spirit directly on bunsen burner, spirit will burn)
3. Till leaf becomes pale white.
   (chlorophyll dissolved in the methylated spirit leaf become pale white)
4. Spread the leaf in a petridish.
5. Add a few drops of iodine on it.

OBSERVATION

1. Leaf turns into bue-black colour.
2. It indicates that the leaf contains starch.

INFERENCE

This experiment proves that leaf contains starch.

PRECAUTIONS

1. We should boil the leaf in methylated spririt over a water bath carefully.
2. We should boil the leaf till it will become pale white.

RAJU'S NATURAL SCIENCE ACADEMY

2. CO_2 IS ESSENTIAL FOR PHOTOSYNTHESIS

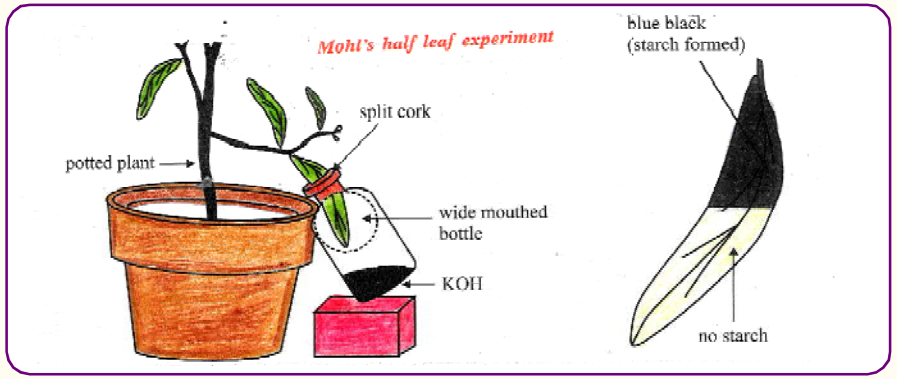
AIM

To prove that CO_2 is essential for photosynthesis.

APPARATUS

1. Potted plant 2. Wide mouthed glass bottle 3. KOH solution
4. Split cork 5. Iodine solution 6. Grease

DIAGRAM



PROCEDURE

1. Take a potted plant with long and narrow leaves.
2. Keep it into dark room for a week days. (due to this, leaves are free from starch)
3. Take a glass bottle. 4. Take 5-6 ml of KOH solution into the bottle.
   (it absorbs the CO_2 which is present in the bottle)
5. Insert half of the leaf into the bottle.
6. Close the bottle with split cork and grease.
   (it prevents the entering of CO_2 into the bottle)
7. Keep the entire setup in sunlight for 4-5 hours.
8. Detach the leaf from the plant. 9. Test the leaf by iodine solution.

OBSERVATION

1. Part of the leaf outside the bottle turns into blue-black colour.
2. Part of the leaf inside the bottle does not turns blue-black colour.

INFERENCE: This experiment proves that CO_2 is essential for photysynthesis.

PRECAUTIONS 1. Before inserting the leaf we should take KOH solution into the bottle.

2. We should close the bottle without leaving any gap.

3. LIGHT IS ESSENTIAL FOR PHOTOSYNTHESIS

original preparation
lab activity
pl. scan QR

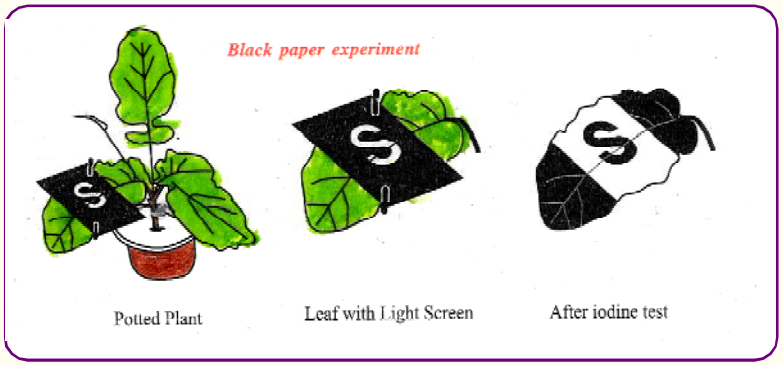
AIM

To prove that light is essential for photysynthesis.

APPARATUS

1. potted plant
2. Iodine solution
3. Piece of black chart
4. Clips

DIAGRAM



PROCEDURE

1. Take a potted plant.
2. Keep it into the darkroom for a week days.
   (due to this, leaves are free from starch)
3. Select a leaf and cover it with a piece of black chart as shown in the diagram.
   (black chart stops sunlight. So, that part of leaf does not exposed to sun light)
4. Keep the entire set up in sunlight for 4-5 hours.
5. Detach the leaf from the plant.
6. Remove the chart piece and test the leaf by using iodine solution.

OBSERVATION

Entire leaf turns blue-black colour except the part covered by the black chart.

INFERENCE

This experiment proves that light is essential for photosynthesis.

PRECAUTIONS

We should fix the black chart on the leaf tightly by using clips.

RAJU'S NATURAL SCIENCE ACADEMY

4. O_2 IS LIBERATED DURING PHOTOSYNTHESIS

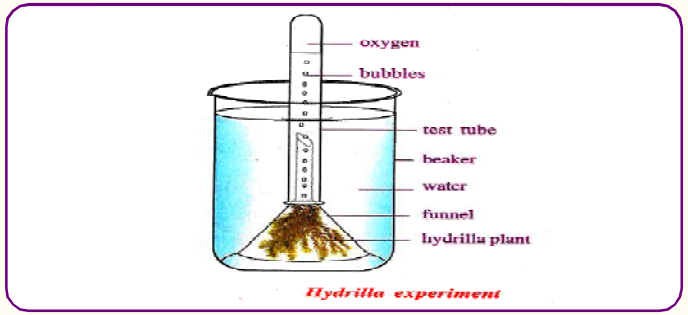
AIM

To prove that O_2 is liberates during photosynthesis.

APPARATUS

1. Beaker
2. Test tube
3. Hydrilla plants
4. Glass funnel
5. Water
6. Glowing splinter

DIAGRAM



PROCEDURE

1. Take a beaker.
2. Fill with water.
3. Take a funnel.
4. Insert hydralla plants in it.
5. Keep funnel into the beaker as shown in the diagram.
6. Take a test tube filled with water.
7. Invert it over the funnel.
8. Keep the entire setup in sunlight.

OBSERVATION

1. Small gas bubbles are come out from the hydrilla plants.
2. These gas bubbles collected at the end of the test tube.
3. Then test the gas with splinter.
4. The splinter glows and burns vigorously.

INFERENCE

This experiment proves that O_2 is liberated during photosynthesis.

PRECAUTIONS

1. We should use sub merged aquatic plants only.
2. Carefully invert and remove the test tube without entering air.

5. HEAT IS LIBERATED DURING RESPIRATION

original preparation lab activity pl. scan QR

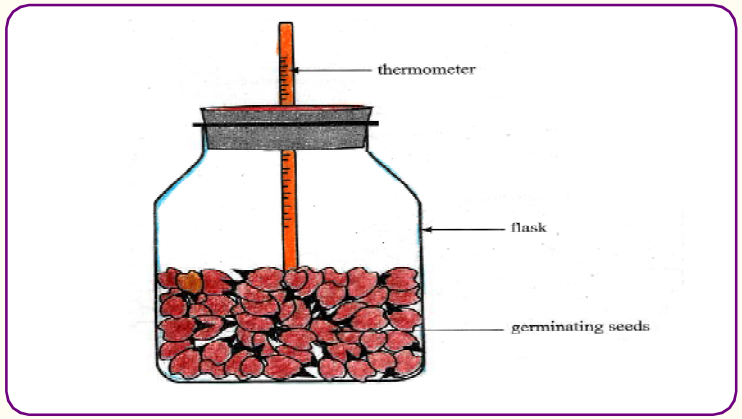
AIM

To prove that heat is liberated during respiration.

APPARATUS

1. Thermometer
2. Germinating seeds
3. Thermos flask
4. One holed rubber cork

DIAGRAM



PROCEDURE

1. Take some germinating seeds in a thermos flask.
2. Close the thermos flask with one holed rubber cork.
3. Insert a thermometer into the thermos flask and as shown in the diagram.
4. Redcord the starting and for every two hours.

OBSERVATION

The temperature slowly increased in the thermometer.
(heat is liberated from germinating seeds during respiration)

INFERENCE

This experiment proves that heat is liberated during respiration.

PRECAUTIONS

1. Close the flask with tight fitting cork.
2. The bulb of the thermometer should dip in the germinating seeds.

6. CO_2 IS LIBERATED DURING RESPIRATION

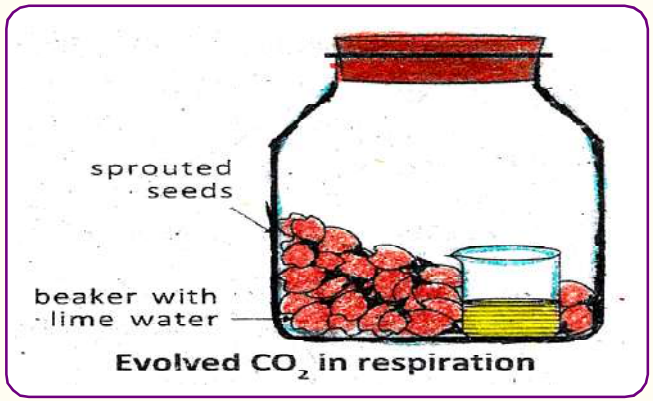
AIM

To prove that CO_2 is liberated during respiration.

APPARATUS

1. Germinating seeds
2. Wide mouthed glass bottle
3. Small beaker
4. Limewater

DIAGRAM



PROCEDURE

1. Take a wide mouthed glass bottle with germinating seeds.
2. Keep a small beaker with lime water into the bottle.
3. Close the bottle tightly with rubber cork.
4. Keep the bottle undisturbed for two days.

OBSERVATION

The colour of lime water turns milky white.
(CO_2 is liberated from generating seeds during respiration)

INFERENCE

This experiment proves that CO_2 is liberated during respiration.

PRECAUTIONS

1. Close the bottle with tight fitting cork.
2. By using grease close the bottle without entering air.

7. ANAEROBIC RESPIRATION IN YEAST

original preparation lab activity pl. scan QR

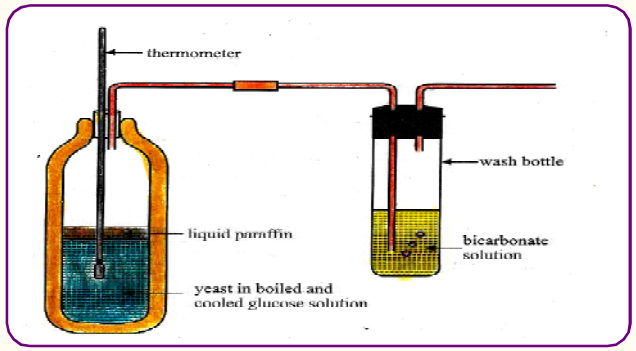
AIM

To understand anaerobic respiration.

APPARATUS

1. Thermos flask
2. Yeast
3. Glucose solution
4. Thermometer
5. Two holed rubber corks - 2
6. Wash bottle
7. Paraffin
8. Glass tubes - 2
9. Lime water

DIAGRAM



PROCEDURE

1. Take a glucose solution into the thermos flask.
2. Boil it for a minute. (It removes dissolved oxygen O_2 from glucose solution)
3. Then cooling it without shaking. 4. Add some yeast to the glucose solution.
5. Pour 1 cm layer of liquid paraffin on the glucose solution.
6. Close thermos flask with two holed rubber cork.
7. Arrange thermometer, glass tubes, wash bottle with lime water shown in the diagram.
8. Keep the arrangement undisturbed for two days.

OBSERVATION

1. Lime water turn into milky white.
   (CO_2 is liberated from yeast during anaerobic respiration)
2. The temperature slowly increased in the thermometer.
   (heat is liberated from yeast during anaerobic respiration)
3. Alcohol smell comes out from the flask
   (alcohol is liberated from yeast during anaerobic respiration)

INFERENCE : Through this experiment we understood anaerobic respiration.

PRECAUTIONS 1. The bulb of the thermometer should dip in the glucose solution.
2. Close the flask with tight fitting cork.
3. First end of the glass tube does not dipped in the glucose solution, but second end must dip in the lime water.

RAJU'S NATURAL SCIENCE ACADEMY

8. DEMONSTRATION OF ROOT PRESSURE

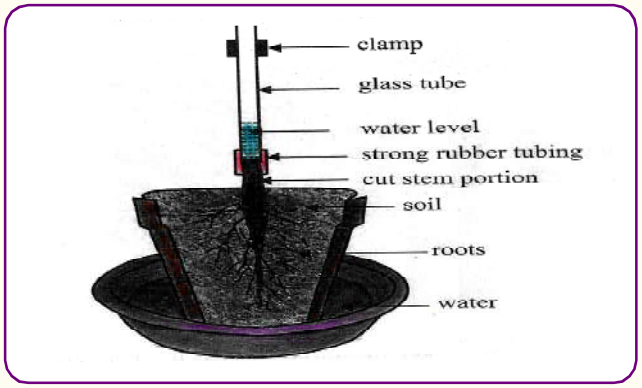
AIM

To demonstrate root pressure in plant.

APPARATUS

1. Potted plant
2. Rubber tube
3. Glass tube
4. Clamp
5. Water
6. Cutter

DIAGRAM



PROCEDURE

1. Take a potted plant.
2. Cut the stem 1cm above the ground level.
3. Connect a glass tube with the help of a rubber tube as shown in the diagram.
4. Pour water in the glass tube.
5. Mark the level of water in glass tube.
6. Leave arrangement for 2-3 hours.
7. Observe the water level in the tube.

OBSERVATION

Water level increased due to root pressure.

INFERENCE

This experiment shows root pressure in plant.

PRECAUTIONS

1. The size of glass tube should be equal to the size of the stem.
2. Join the tube and stem tightly.

9. XYLEM IS WATER CONDUCTING TISSUE IN PLANTS

original preparation lab activity pl. scan QR

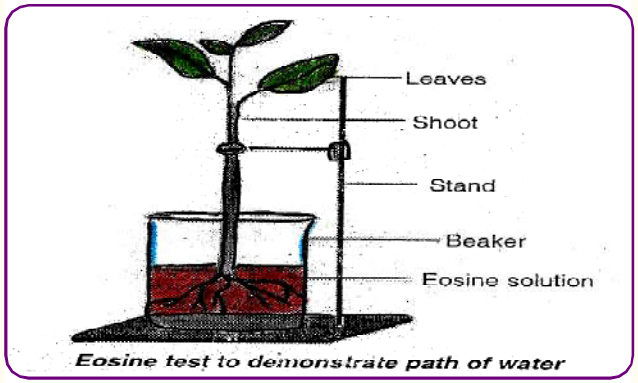
AIM

To observe the path of water through a plant.

APPARATUS

1. Balsam plant
2. Beaker
3. Microscope
4. Eosine solution
5. Stand
6. Blade

DIAGRAM



Eosine test to demonstrate path of water

PROCEDURE

1. A leafy green shoot of Balsam plant with a transparent stem is placed in Eosine solution. [It is red dye resulting from the action of bromine]
2. After sometime red streaks appear in the stem and veins of leaves become red.

OBSERVATION

1. If a transverse section is cut through the root stem and leaves, the tissue that has been stained in xylem tissue.
2. This shows that water moves up the root into the stem and leaves in the xylem tracheids and vessels.

INFERENCE

1. The xylem tissue is the tissue responsible for the movement of water through the plant.

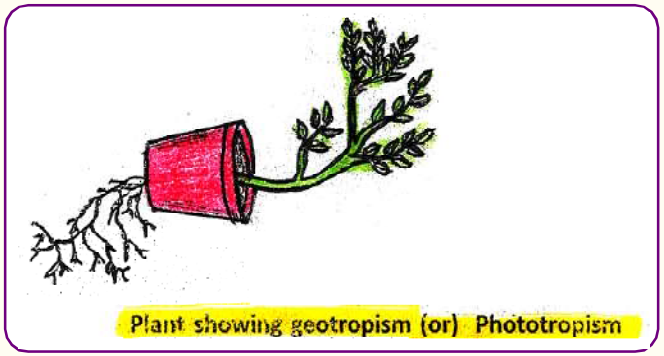
10. SHOOTS SHOWS PHOTOTROPISM/ROOTS - GEOTROPISM

AIM: To prove that shoots / plants shows phototropism.
To prove that roots shows geotropism.

APPARATUS

Potted plant

DIAGRAM


Plant showing geotropism (or) Phototropism

PROCEDURE

1. Take a potted plant.
2. Break the lower part of the pot carefully.
3. Turn the pot and place it horizontally.
4. Observe the growth of roots and shoots after a week.

OBSERVATION

1. Shoots grow towards light.
2. Roots grow towards the soil.

INFERENCE

This experiment shows phototropism in shoots and geotropism in roots.

PRECAUTIONS

1. We should remove the bottom of the pot without damaging the roots.
2. Keep stones besides the pot for prevent rolling of pot.

11. ACTION OF PTYALINE ON STARCH

original preparation lab activity pl. scan QR

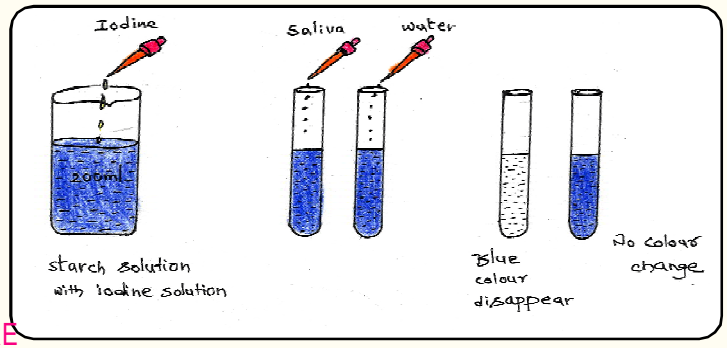
AIM

To show the action of ptyaline (salivary enzyme) on starch

APPARATUS

1. Test tube
2. Saliva
3. Starch powder
4. Iodine
5. Paraffin

DIAGRAM



PROCEDURE

1. Collect saliva into a test tube and filter it.
2. Take 10ml of starch solution into a test tube.
3. Add 2 drops of iodine solution to it.
4. Starch solution changes into blue black colour.
5. Then divide it into 2 parts in two test tubes.
6. Add 5ml of saliva into first part.
7. Do not add anything into the second part.
8. Keep these test tubes in a testtube stand and observe.

OBSERVATION

1. We will not find any colour change in the test tube to which water is added.
2. We will find the colour change in the test tube to which saliva is added.

INFERENCE

This experiment shows the action of saliva (Ptyaline) on starch.

PRECAUTIONS

1. Clean your mouth before collecting saliva.
2. Carefully handle the glass waste.

RAJU'S NATURAL SCIENCE ACADEMY

SPECIAL BITS
(MULTI PURPOSE)

1. NUTRITION

PI. Scan QR for IIIT Entrance and 10th Public exams important bits (videos)

1. Which life process gives us food and oxygen? or The process that makes plants universal food providers is.....?
2. Name the figure like Projections present in small Intestine.
3. Give an example for parasitic plant.
4. How many Salivary glands are present in Human beings?
5. What are the Assimilatory Powers?
6. Give example for "Saprophytes".?
7. Which Vitamin deficiency leads to 'Nervous Disorders'?
8. What are the root like structures in Cucuta (DODDER) That Penetrate into the host plant for Absorbing food materials?
9. Amoeba takes food by using temporary finger like extension.What are they?
10. Over eating and excess of Calories intake causes.....?
11. What are the end products of Photosynthesis?
12. Which disease occurs when there is an immediate second pregnancy or repeated child births?
13. Which pigment causes? Starts photosynthesis?
14. Which Vitamin is synthesized by bacteria present in Intestine?
15. What are the colours of Chlorophyll 'A' and Chlorophyll's'?
16. Hemoglobin contains iron atoms. While Chlorophyll contains.?
17. How many Magnesium atoms are present in each Chlorophyll pigment?
18. Vitamin K (PHYLLOQUINONE) deficiency leads to.....
19. Which gas is utilized and which gas is liberated during Photosynthesis?
20. What are the requirements (ESSENTIAL FACTORS) for Photosynthesis?
21. Which digestive juice contains no Enzymes?
22. What are the end products of Carbohydrates, proteins and fats in digestion?
23. What is the meaning of (CHLOROPHYLL) in Latin?
24. Vitamin B 12 (CYANOCOBALAMIN) deficiencies leads to.....
25. How many phases are there in Photosynthesis? What are they?
26. The smallest unit of light Energy is.....
27. How many pigment Molecules are grouped as light Harvesting complex (PHOTOSYNTHETIC UNIT) in geranium ?
28. Who discovered Chlorophyll?
29. Where does Photosynthesis take place? (OR) What are the sites of Photosynthesis?
30. Who discovered Chloroplast?
31. Who showed 02 is released from Water?
32. Which ions are produced from water during Photolysis?
33. Which vitamin deficiency leads to "pellagra"?
34. Where does Dark Reaction take place?
35. What are the Enzymes that act on Proteins?
36. Who coined the name Oxygen?
37. How many Chloroplasts are present in plant cells?
38. Give examples for Autotrophy?
39. Give example for Heterotrophy
40. Give example for Parasites.
41. Protein Deficiency in diet leads to. ? (OR) Protein mal Nutrition causes. ?

84. Who Hypothesized 'Plants restore the air what breathing Animals and Burning candle remove'?
85. Mouth cracks at Corners red and sore Tongue are the Symptoms of .....?
86. Which Vitamin helps in healing of wounds, fracture of bones?
87. Food in the form of a soft slimy substance where some proteins and Carbohydrates have already been broken down is called.....?
88. Longest part of the Alimentary canal is .....?
89. Walls of the small intestine secrete Intestinal juice Called .....?
90. To remove Chlorophyll from a leaf, It should be boiled in .....?
91. In which phase of the Photosynthesis carbon Dioxide converted into Glucose?
92. Who detected the point of maximum rate of photosynthesis in 20th Century?
93. The food Synthesized by the plant is stored as.....?
94. Which part of the plant takes in carbon Dioxide from the air for Photosynthesis?
95. Loss of Leucocytes is due to the defiance of.....Vitamin
96. The site of Ingestion of food in Paramecium is.....
97. Food is cut and Crushed by our teeth in the Mouth is called.....
98. Colorless fluid present in Chloroplast is.....
99. Splitting of water Molecule into **H+** and **OH-** by the light Activated Chlorophyll is knows as.....
100. Write the Chemical Equation of Photosynthesis proposed by C.B. VAN NEIL in 1931

2. RESPIRATION

Pl. Scan QR for IIIT Entrance and 10th Public exams important bits (videos)

1. Which is the energy Releasing life Process?
2. What are the Special horn like Structures formed from roots of Mangrove plants for Respiration ?
3. Which Organelle is called "POWER HOUSE OF THE CELL"?
4. The term "RESPIRATION" is derived from.....
5. Latin word 'Respire' means.
6. What are the Structural and Functional units of the Lungs? (OR) Cluster of air sacs in Lungs are called.....
7. Name the person who told "RESPIRATION IS SIMLAR TO COMBUSTION"
8. Name the Membrane that Protects the lungs..
9. "HUMAN PHYSIOLOGY" was written by.....
10. By which process Gaseous exchange takes place in Alveoli.
11. A Muscular sheath Present at the floor of chest Cavity is.....
12. In which part Inhaled airs become Warm and Moist?
13. Name the flap like Muscular valve that controls movement of food and air towards their Respective passages.
14. Which solution is used to identify the presence of Oxygen in Anaerobic Respiration experiment?
15. Respiration through skin is called.....
16. Which gas precipitates the limewater? (OR) Which gas turns lime water into milky white?
17. Which part of the Respiratory system produces sounds on the basis of our Speech, song etc,.
18. Which is the common passage of Digestive and Respiratory system?
19. Respiration that occurs in adequate supply of Oxygen is called.....
20. Respiration that Occurs in Inadequate supply of Oxygen is called...
21. What is the Percentage of Carbon dioxide in Inhaled and Exhaled air?
22. Branchial respiration Occur in.....
23. "Energy currency" of the cell is..... (OR) Which is "A SMALL PARCEL OF CHEMICAL ENERGY" ?

7. COORDINATION IN LIFE PROCESSES

Pl. Scan QR for IIIT Entrance and 10th Public exams important bits (videos)

1. Which Hormone increases hunger Pangs? (OR) When the Glucose levels in the blood fall, then we get hunger pangs due to the Secretion of.....
2. Which nerve plays an important role in carrying hunger Signals to the Brain?
3. What is the result of Increasing the Hormone Gremlin?
4. Which Hormone suppresses the Hunger Pangs?
5. Chemoreceptors are the present in.....
6. Which controls the Secretion of Saliva by the Salivary Glands?
7. The Muscular and Sensory organ in the Oral Cavity is....
8. The Mechanism for Swallowing is coordinated by.....
9. Contraction and Relaxation of the Muscles in the gut Brings a wave like Motion called
10. Peristalsis is Involuntary and Under the Control of.....
11. Which Sense are closely Related?
12. Taste Receptions are Present in.....
13. Name the Receptors that present in the nasal Cavity and are Responsible for the Sense of smell.
14. Name the Scientist who Conducted Experiments on dogs and found that even the thought of food will water our mouth (CONDITIONED REFLEXES)?
15. How many teeth is Present in the oral Cavity?
16. Name the Different types of teeth and their Number.
17. What is the Shape and Function of Incisors?
18. What is the Shape and Function of Canines?
19. What is the Shape and Function of Premolars and Molars?
20. What is the Human dental Formula?
21. In mouth (ORAL CAVITY) food Materials are Grind and Chew with the help of teeth. This Process is called.....
22. Which cranial nerve controls the Movements of Muscles in the jaw (MASTICATION)?
23. The Masticated food slurry mass is called.....
24. Name the long tube that connects the Pharynx and Stomach.
25. What are the Values of PH scale?
26. Nature of the Saliva is.....
27. Name the Enzyme present in Saliva.
28. How much Saliva we Secrete per day?
29. Which Chemical is used to test the Presence of Starch? (OR) Which Chemical is used as Starch Indicator?
30. Where does Digestion start? (OR) Which part of Digestive system acts as Munching Machine?
31. Walls of the food Pipe secrete a Slippery substance called...
32. Which substance lubricates and protects the esophageal walls from Damage?
33. The walls of Esophagus are made up of. Muscles.
34. The inner Layer of walls of Esophagus is made up of.....
35. The outer Layer of walls of Esophagus is made up of.....
36. Which Glands are present in the walls of Stomach?
37. Name the Acid that Secreted into the Stomach.
38. In the Stomach Digestive juices turn food into a Smooth porridge like Consistency called... (OR) Partially Digested food in Stomach is called.....
39. Which Sphincter is present at the opening of the Stomach into Duodenum?
40. Which type of movements occur in Esophagus at the time of Rumination in Animals?
41. Which part of the digestive system acts as the mixer and Digester?

31. The lake Kolleru Discharges its excess water into the bay of Bengal through the Twisty Channel called...
32. What is the length of Upputeru?
33. When the Government of Andra Pradesh did declared the Kolleru lake as bird Sanctuary.
34. How many birds are migrated from Northern Asia and Eastern Europe to Kolleru lake?
35. In between which months birds Migrate to Kolleru Lake?
36. Expand DO.
37. Expand BOD.
38. Expand MOEF.
39. Indiscriminate usage of Pesticides leads to....
40. The process of Entering Pollutants in the food chain is called.....
41. The Tendency of Pollutants to concentrate as they move from one Tropic level to the next is called.....
42. Non Degradable Pesticides contain harmful Elements what are they?
43. Expand EBWR.
44. Which is a Cheap and high Proteinaceous fish used as food, Living in Polluted Edward?
45. What are the heavy metals, Bio accumulated into fishes living in EBWR?
46. Name the Disease Discovered in Imamate city in Japan, in 1956.
47. Name the Chemical that caused Minimart dieses in Japan.
48. Growing Different crops on A Particular piece of land in Successive Years is called.....
49. Suggest one Biological control method for preventing usage of Pesticides.
50. In which Country most of the Sparrows were killed in 1958?

10. NATURAL RESOURCES

Pl. Scan QR for IIIT Entrance and 10th Public exams important bits (videos)

1. Give examples for Natural Resources.
2. The Resources that can be replaced after they are used are called.....
3. The Resources that cannot be replaced after they are used are called.....
4. What is the Percentage and Source of salt Water on Earth?
5. What is the Percentage and Source of fresh Water on Earth?
6. What are the Micro Irrigation Techniques?
7. Construction of Percolation tanks and Sock pits Increases.....
8. Expand ICRISAT.
9. ICRISAT educate Villagers and provide Technical support for...
10. "Center for world Solidarity" is Present in....
11. Expand BBF.
12. Which plants are grown by Farmers on field Bunds?
13. Why should farmers grow Gliricidia plants on fields on field Bunds?
14. "Contour felid bonding" helps in.....
15. Expand TMC.
16. Expand UNDP.
17. Expand FAO.
18. Expand MTR.
19. What is the 4R'S principle?
20. Expand IUCN.
21. Usage of the Environment in ways that ensure the Resources for Future is called..... (OR) Development without Damaging is called.....
22. What are the "Lungs of the Earth"? (OR) Who serves as Lungs for the World?
23. Which plants are used for Production of Bio fuel?
24. Variety of Living things that populate the earth is known as....
25. Drip Irrigation can reduce water Consumption by.....

ONE WORD QUESTIONS

1. NUTRITION

Pl. Scan QR for IIIT Entrance and 10th Public exams important bits

1. Who proposed the equation for Photosynthesis ?
2. Which agent is used to identify the starch present in the leaves ?
3. Who coined the name oxygen ?
4. What are the materials required for Photosynthesis ?
5. Why do we keep the plant in dark room for some days before conducting experiments of Photosynthesis ?
6. Which chemical substance obsorbs carbon dioxide ?
7. What kind of light rays are favourable for Photosynthesis ?
8. Which acquatic plants are used in Photosynthesis to prove O_2 is released ?
9. What are the sites of Photosynthesis ?
10. Which molecule is present in the chlorophyll ?
11. Who detected the point of maximum rate of Photosynthesis ?
12. Define Photolysis ?
13. Who discovered Photolysis ?
14. Who discovered chlorophyll ?
15. What are the end products of light reaction ?
16. Where does light reaction take place ?
17. Expand ATP ?
18. Where does gaseous exchange take place ?
19. Give some examples for parasitic nutrition ?
20. What is RuBP ? (in dark reaction)
21. Which part helps the unicellular organisms to obtain food ?
22. Which part helps amoeba to collect food ?
23. Cascuta is a parasitic plant. Why ?
24. How does haustoria help cuscuta ?
25. Which family does cuscuta belong to ?
26. What is meant by digestion ?
27. Which enzyme is present in the saliva ?
28. Which acid does gastric Juice contain ?
29. What is peristaltic movement ?
30. Which structure controls food passing from stomach into small intestine ?
31. Which juice does not have enzymes ?
32. What are villi and what is their use ?
33. What does the deficiency of proteins and calories cause ?
34. Which disease is caused by the deficiency of proteins ?
35. What are water soluble vitamins ?
36. What are fat soluble vitamins ?
37. What symptoms do you observe in the disease caused due to the deficiency of vitamin A?
38. Which vitamin helps in healing of wounds ?
39. Which vitamin deficiency causes pellagra ?
40. Which vitamin helps in blood clotting ?
41. Which vitamin is synthesised by bacteria present in intestine ?

2. RESPIRATION

1. What does exhaled air contain ?
2. Which gas turns limewater milky ?
3. Which is the common passage of digestive and respiratory system ?
4. Where are vocal cards located ?
5. What is epiglottis ? What is its function ?
6. What are sac like structures in the lungs called ?
7. Where does gaseous exchange take place ?
8. What do we call the two membranes which protect the lungs ?
9. How does diaphragm help the lungs ?
10. What plays a major role in the respiration of woman ?
11. What is the molecule present in the haemoglobin ?
12. In prokaryotic cells where does cellular respiration occur ?
13. What are the sites of reactions in eukaryotic cells ?
14. What are the end products of aerobic respiration ?
15. What are the end products of anaerobic respiration ?
16. What is meant by fermentation ?
17. What is energy currency ?
18. How many calories does one ATP give ?
19. What causes muscular pain ?
20. When we do strenuous exercies what do we build up ?
21. What is added to glucose solution to check that O_2 is removed ?
22. According to Lavoisier and Rabinson what kind of process is respiration ?
23. How does gaseous exchange happen in single celled organisms ?
24. Name some animals which respire through trachea ?
25. Where does gaseous exchange take place in the plants ?
26. In what form do animals release energy ?
27. Through which parts do mangrooves respire ?
28. How is some part of energy stored in the cellular respiration ?
29. Where does Photosynthesis take place ?
30. Where does respiration occur ?
31. What is meant by pulmonary respiration ?
32. What factors affect the ratio of photosynthesis and respiration in plants ?

3. TRANSPORTATION

1. Which process does transportation occur in lower organisms ?
2. Who invented Stethoscope ?
3. What are the layers around the heart called ?
4. What protect the heart from shocks ?
5. How many chambers are there in the heart ?
6. Which is the largest artery ?
7. Which valve is situated between the left atrium & left ventricle ?
8. Who studied double circulation of the blood ? Give an Example ?
9. Who noticed the valves in the veins ?
10. Who discovered capillaries in the wings of bats ?
11. What is cardiac cycle ?
12. How long does cardiac cycle take ?
13. What is single circulation ?
14. What is the circulation called if the blood flows through the heart twice ?

15. Who proved that bodily changes are not inherited ?
16. Who proposed "Natural selection"?
17. What was the name of ship in which darwin travelled ?
18. In which birds did Darwin observe diversity in structure in galapogos islands ?
19. Who wrote the book 'principles of geology' ?
20. What are homologous organs ? Give some examples ?
21. Which organs are known as analogous organs ?
22. What are fossils ?
23. What is the study of fossils ?
24. By which method the age of fossils can be found ?
25. Which isotopes are used in carbon dating method ?
26. Where was ketosaures, fossil of the dinosarus found ?
27. What is the connecting link between aves and reptiles ?
28. How many vestigial organs are there in human being ?
29. Which vestigial organ is attached to the large intestine in man ?
30. Give some examples for vestigial organs ?

9. OUR ENVIRONMENT

1. What happens in the number of organisms from the producers to consumers in a food chain ?
2. What is the main source of energy of an ecosystem ?
3. What is niche ?
4. Who introduced ecological pyramid for the first time ?
5. Where are the producers represented in the pyramid ?
6. What is biomass ?
7. Expand BOD ?
8. What is the process of entry of pollutants into a food chain called ?
9. What is the tendency of pollutants to concentrate as they move from one trophic level to the next level ?
10. Which committee did the Government of India introduced to protect the kolleru lake ?
11. What are the heavy metals found in Edulabad Reservoir ?
12. What disease is caused due to the mercury poision ?
13. In which country did sparrow campaign happen ?
14. A farmer introduces some reptiles to prevent insects in his field. What is this method ?
15. Which is the best method for prevention of pests ?

10. NATURAL RESOURCES

1. What is the alternative method used to conserve the ground water level ?
2. What does ICRISAT stand for ?
3. Which methods are suitable for the farmers with low water resources ?
4. Which plants should farmers grow on field bunds to make the soil rich in nitrogen ?
5. Expand BBF ?
6. What is UNDP ?
7. What is FAO ?
8. Give some examples for renewable resources ?
9. What do the ways of environment that ensure resources for the future lead to ?
10. What is contour strip cropping ?
11. Where are fossil fuels produced ?
12. Give some examples for fossil fuels ?
13. Which plant seeds are used in the production of bio diesel ?
14. What is meant by 4R ?
15.  What does this logo indicate ?

THINKING SKILLS BITS

ARRANGE THE FOLLOWING IN A SEQUENTIAL ORDER

Thinking Skills
12 types objective
type bits (videos)
pl.scan QR

1. S phase, G_1 phase, G_2 phase, M phase
2. Rectum Stomach, Duodenum, Small intestine
3. Vasa deferentia, Vasa efferentia, Epididymis, Ejaculatory duct
4. Ramapithichus, Astrolopithicus, Diopithicus, Homo habilus
5. Metaphase, Telophase, Prophase, Anaphase
6. Trachea, Bronchioles, Larynx, Bronchus, Alveolus, Pharynx
7. Association nerve, Sensory organ, Efferent nerve, Muscle, Afferent nerve
8. Tubular secretion, Formation of urine, Glomerular filtration, Tubular reabsorption
9. Aorta, Body parts, Ventricles, Auricles
10. Keep the plant in dark room, select potted plant, Place the potted plant in sun light, Cover the leaf with black paper.
11. Fruit, Embryo, Fertilisation, Seed Zygote.
12. Formation of ATP & NADPH, Formation of Glucose, Activation of chlorophyll, Photolysis.
13. Absorption, Ingestion, Defecation, Digestion.
14. Gaseous exchange at lungs level, Breathing, Cellular respiration, Gaseous exchange at tissue level, Gas transport by blood.
15. PCT, Glomerulus, DCT, Loop of Henle, Collecting tube
16. Ureters, kidney, urethra, urinary bladder.
17. Stamens, petals, carpels, sepals.
18. Fish, zoo plankton, Man, Animal plankton.
19. Vagina, Fallopian tube, Ovary, Uterus.
20. Frog, Hawk, Grass, Snake, Grosshopper.

CLASSIFICATIONS, FLOW CHARTS & GRAPHS

1. Mouth → Buccal Cavity → ? → Oesophagus → Stomach

2. Vitamins
   - Water soluble vitamins → B & C
   - Fat soluble vitamins → ?

3. Nostrils → Nasal cavity → Pharynx → Larynx → ?

4. Respiration
   - End products of aerobic respiration → $CO_2 + H_2O$
   - End products of anaerobic respiration → ?

5. Blood vessels
   - Arteries → oxygenated blood
   - Veins → ?

6. Blood filtration
   - Natural filtration → kidney
   - Artificial filtration → ?

7. Bio chemical substances in plants
   - Primary metabolites → Carbohydrates, proteins, Fats
   - Secondary metabolites → ?

8. sensory organ → Afferent nerve → ? → Efferent nerve → Muscle

GIVE EXAMPLES

1. Give two examples for Saprophytes.
2. Give examples for Parasites.
3. Name two enzymes that digest proteins.
4. Name some diseases caused by Malnutrition.
5. Give examples for water soluble vitamins.
6. Give examples for fat soluble vitamins.
7. Give two examples for the animals which respire through trachea.
8. Give examples for single circulation.
9. Give examples for double circulation.
10. Give examples for the animals which have closed type of circulatory system.
11. Give some examples for primary metabolites.
12. Give some examples for secondary metabolites.
13. Give some examples for alkaloids.
14. Name some plants in which tannins are stored.
15. Give some examples for endocrine glands.
16. Give some examples for plant hormones.
17. Give an example for the plant that shows nastic movement.
18. Give some examples for the animals which reproduce by fission.
19. Give some examples for the organisms which reproduce by fragmentation.
20. Give some examples for the plants which propogate through stolons.
21. Give some examples for the plants which propagate through cutting.
22. Name some plants which propagate through grafting
23. Give some examples for sexually trnasmitted diseases.
24. Name some animals which have reverse peristalsis.
25. Give some examples for homologous organs.
26. Give some examples for analogous organs.
27. Give some examples for radioactive isotopes.
28. Give some examples for the vestigial organs present in human being.
29. Name some diseases caused by water pollution.
30. Give some examples for non degradable pesticides.
31. Give some examples for heavy metals found in Edulabad water reservoir.
32. Name some plants which are grown on field bunds to increase nitrogen in the soil.
33. Give some examples for renewable resources.
34. Give some examples for non renewable resources.
35. Give an example for soil conservation method.

READ THE SENTENCE, FIND THE ERROR & REWRITE IT

1. Haemoglobin is a red coloured pigment. It helps in the process of Photosynthesis.
2. Iron is present in chlorophyll of chloroplast.
3. In photolysis water molecule splits into hydrogen and oxygen ions.
4. The deficiency of calciferol causes a skin disease called Pellagra.
5. Aerial roots are present for respiration in desert plants.
6. When air passes into the lungs it causes vocal cards to vibrate.
7. Absence of adrenalin hormone produces dilute urine.
8. The liquid portion after formation of blood clot is lymph.
9. Kidney shows two regions. Dark coloured outer zone is called Medulla.
10. Nerve cell consists of an axon with a prominent nucleus.
11. The secretions secreted by ductless glands are called hormones.
12. Cardiac and vasomotor activities are controlled by cerebellum.
13. The majority of flowering plants have an embryosac consisting of 7 cells and 7 nuclei.
14. Digestive juices turns the food into a smooth porridge like consistency called bolus.
15. The process of entry of pollutants into a food chain is known as Biomagnification.
16. The valve present on the right auriculo ventricular septum between right atrium and right ventricle is referred to as Bicuspid valve.
17. Arteries bring blood from all body parts to the heart.
18. The postcaval vein collects blood from anterior parts of the body.
19. Mitosis occur only during the formation of gametes in sexual reproduction.
20. Insulin hormone is also called fight (or) flight hormone.
21. The hormone leptin secreted in the stomach is responsible for hunger generating sensations.
22. Charles Darwin proposed "Inheritance of acquired characters".
23. The process of acquiring characters (or) traits from parents is called Inheritance.
24. Any type of plant or animal material that can be converted into energy is called biofuels.

"SLOGANS'

* Organ donation :

1. Donate organs save lives.
2. Donate organs - Live after death.
3. Organ donation life goes on.
4. Be an organ donar recycle your life.
5. Organ donation is a gift for life.
6. Donate organs - give life - live life
7. Organ donation is the only chance for second life.
8. Be a hero, be an organ donar.
9. I am proud to be a organ donar.
10. You can't take organs with you - kepp them alive.

* Against child marriage :

1. Avoid child marriage, prevent childhood.
2. Girls not brides.
3. Girl for education - women for marriage.
4. East or west child marriage is waste.
5. Say "no" to child marriage.
6. Child marriage is a loosing game.
7. Let a child be a child, stop child marriage.
8. No child marriage - no crime.
9. Child marriage is child abuse.
10. A girl's right to say no to marriage.

* Against foeticide :

1. Stop foeticide - save the girl child.
2. Girls are angels - stop foeticide.
3. Save the girl child - save the nation.
4. Female foeticide is a crime.
5. Don't destroy the future by foeticide.
6. If there is no she there is no future.
7. Eliminate inequality, not girls.
8. Let girls live - stop foeticide.

* ECO friendly slogans :

1. Live and let live.
2. If we protect environment - it protect us.
3. Save energy - save lives.
4. Turn the waste into compost.
5. Save the earth, save ourselves.
6. East or west going green is the best.
7. Global warming is a warning.
8. Each one - Teach one - How to plant one.
9. Keep our forests green.
10. Clean and green is our perfect dream.
11. Say "No" to bikes - 'Yes" to cycles.
12. Green planet is a clean planet.
13. Clean and green is main solution for pollution.
14. Save paper - Save trees - Save the planet.
15. Encourage friendly insects - Discourage toxic pesticides.

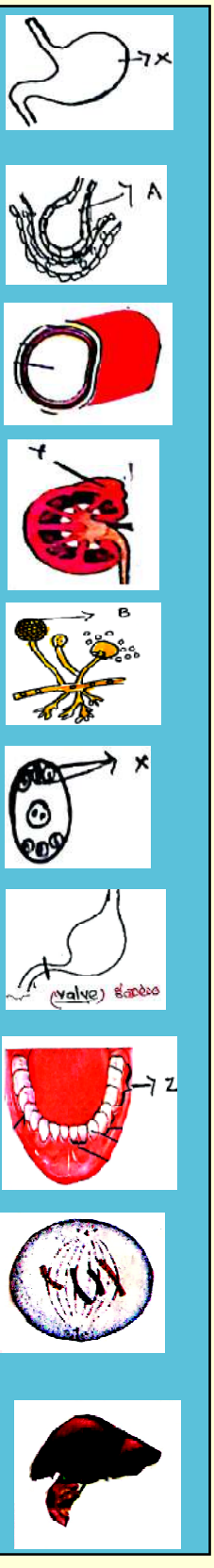
* "Crop selection and cultivation should be based on availability of water" :

1. Don't worry about less water - there are millets.
2. Suit your crop and cultivation water availability and earn more.
3. Water shortage ? No worry - "Use sprinkling method".
4. Less water ? No worry-use drop irrigation.
5. Grow millet crops avoid water worries.
6. Select suitable crops for your water availability - avoid water worries.

ANSWER THE QUESTIONS WITH THE HELP OF PARAGRAPH

1. Saliva contains an enzyme (a) _____ which helps in the breakdown of complex carbo-hydrates to simple ones. This process of breaking down of complex substances into simple substances is called (b) _____
2. Fats are digested by converting them into small globule like forms by the help of _____ secreted from liver. This process is called _____
3. Haemoglobin, Pigment Quite like chlorophyll. The major difference between haemoglobin and chlorophyll is haemoglobin contains _____ where as chlorophyll contains _____
4. In plants gaseous exchange takes place in _____. It also takes place like surface of roots _____ on stem.
5. Blood is a substance which contains solid and liquid particles._____ is the substance that contains blood with out solid particles. The liquid portion after formation of blood clot is _____
6. When the blood flows out, the platelets release an enzyme called _____. Thrombin acts on another substance called _____ that is present in dissolved state.
7. Kidney shows two regions. Dark coloured outer zone is called the _____ and pale inner zone is called _____
8. The life span of RBC _____ days. After that they get destroyed in the liver and produces bile pigments like _____ which are metabolic wastes of haemoglobin of dead R.B.C.s.
9. The brain is covered by three layers called _____. The space between the inner layers filled with fluid called _____ It protects the brain against shocks.
10. In sexually reproducing organisms usually single fertilisation give rise to _____. In plants there occurs a second fertilisation giving rise to _____
11. The walls of the food pipe secrete a slippery substance called _____. It lubricates and protects the oesophageal walls from damage. This helps the food _____ to slide down easily move in the tube.
12. Passing of characters from parent to offsprings is called _____. The process in which traits are passed from one generation to another generation is called _____
13. The study of fossil is called _____. Palaeontologists determine the age of fossil by using _____ method.
14. Any type of plant or animal material that can be converted into energy is called _____. When these materials are used for energy production they are known as _____
15. _____ were produced from remains of ancient plants and animals. They include _____

OBSERVE THE DIAGRAM, IDENTIFY THE PART

1. 

Which part does 'X' represent in this picture ?

2. What is the structure shown by 'A'

3. What blood vessel does this diagram indicate ?

4. Which endocrine gland is shown by 'Y' above the kidney?

5. Which part is shown by 'B' in Rhizopus ?

6. What are the names of cells pointed by 'X' ?

7. What is the name of the valve in this diagram ?

8. What kind of teeth are represented by 'Z' ?

9. Which phase of cell division does this diagram show ?

10. Name the gland of our body shown in this diagram ?

WHO AM I ?

1. I have tough fibrous coat, lumen and valves. Who am I ?
2. I am present in saliva. I turn complex carbohydrates into simple ones. Who am I ?
3. I am special compound for the storage of energy, which is released from the breakdown of glucose. I am called energy currency. Who am I ?
4. I am a plant. I can't prepare food because chlorophyll is absent in me. Who am I ?
5. I respire through skin, lungs and bucco pharyngal cavity. Who am I ?
6. I am like a flap like structure. I am present in pharynx. I protects the tube to the lungs, arresting entry of food. Who am I ?
7. I am present in the bark of cinchona officinalis. I am a cure for Malaria. Who am I ?
8. I come from posterior part of the heart. I collect blood from hand and legs of the body. Who am I ?
9. I am a connecting link between the afferent and efferent nerves. I am present in spinal card. Who am I ?
10. I am tiny finger like projections grow from the surface of the outer membrane of the embryo. My tissues and adjacent part of the uterine tissue make up the placenta. Who am I ?
11. I am a highly coiled tube located along the posterior side of testis. Sperms are stored in me. Who am I ?
12. I studied the veins in the leg. I noticed that they had small valves in them. Who was I ?
13. I am a hormone. I am secreted when you feel your stomach is full and there is no need of food any more.
14. To test the presence of carbohydrates in a leaf I am used. I turn the leaf into blue-black colour. Who am I ?
15. All arteries carry oxygenated blood. But I carry de-oxygenated blood. Who am I ?
16. While a person is taking rest, if he has more blood pressure than normal I am present. Who am I ?
17. To prove food transport occurs through phloem, biologists conducted experiments on me. Who am I ?
18. I add yellow colour to urine, when haemoglobin is destroyed. Who am I ?
19. To prevent blood clot in dialysis, I am mixed with blood and sent to dialyzer. I act as anticoagulant. Who am I ?
20. Bio-diesel is made from the seeds of me and used as bio-fuel. Who am I ?
21. I am the functional region of contact between two neurons, where information from one neuron is transmitted to another neuron. Who am I ?
22. I am the centre for certain emotions such as anger, pain happiness. Who am I ?
23. I am a tissue. I am formed at around 12 weeks of pregnancy and becomes an important structure for nourishment of the embryo. Who am I ?
24. Bacteria present in the intestine synthesizes me. My deficiency causes pernicious anaemia. Who am I ?
25. When blood flows out, the platelets release me. I am an enzyme. I play a vital role in blood coagulation. Who am I ?
26. I am a hormone. When sugar levels are higher than normal I am released and bring down the sugar levels to normal. I am present in pancreas. Who am I ?

ABBREVIATIONS

ATP	Adenosine Tri Phosphate
NADPH	Nicotinamide Adenosine Dinucleotide Hydrogen Phosphate
ADP	Adenosine Di Phosphate
BP	Blood Pressure
PCT	Proximal Convoluted Tubule
DCT	Distal Convoluted Tubule
ESRD	End Stage Renal Disease
CNS	Central Nervous System
PNS	Peripheral Nervous System
ANS	Autonomous Nervous System
ACTH	Adereno Cortico Trophic Hormone
LH	Lutenising Hormone
FSH	Follicle Stimulating Hormone
STD	Sexually Transmitted Diseases
AIDS	Acquired Immuno Deficiency Syndrome
HIV	Human Immuno Deficiency Virus
ART	Anti Retroviral Therapy
ASHA	Accredited Social Health Activist
EBWR	Edulabad Water Reservoir
ICRISAT	International Crop Research Institute for Semi Arid Tropics
BBF	Broad Bed Furrow
BOD	Bio chemical Oxygen Demand
TMC	Thousand Million Cubic feet
UNDP	United Nations Development Programme
FAO	Food and Agriculture Organization
MTR	Mountain Top Removal
IUCN	International Unior for the Conservation of Nature
SEZ	Special Economic Zone
CFC	Chloro Fluoro Carbons

SCIENTISTS AND INVENTIONS

Sl.no.	Name of the Scientist	Year	Discovered (or) innovated
1.	Von Helmont		* Plants get their food materials not only from soil but also from other sources. * Water was essential for the increase of plant mass.
2.	Van Neil (Dutch)	1931	* Light plays a specific role in photosynthesis. * Sulphur bacteria utilized H_2S instead of H_2O for photosynthesis. In this process sulphur liberated instead of O_2. * Proposed an equation for photosynthesis $CO_2 + 2H_2O \xrightarrow[Chlorophyll]{light} CH_2O + H_2O + O_2$
3.	Priestly	1774	* He did experiments with mint plant, candle and mouse and discovered oxygen.
4.	Lavoisier		* The name “Oxygen” was first coined by him.
5.	Jan Ingeh housz	1979	* He did hydrill piants experiment and noticed “Oxygen released from plants only in the presence of light”.
6.	Engel man	20th century	* did experiments on algae. * detected “point of maximum rate of photosyn”.
7.	Pelletier of Caventou	1817	* extract green coloured substance from leaves and named that chlorophyll.
8.	Julius Von sachs	1883	* chlorophyll does not spread in through out the plant cell. It present only in the organalle called “chloroplast”.
9.	Daniel I. Arnon.	1954	* seperate the chloroplast from leaf with out any damaging.
10.	John Daper	19th century	* Human physiology - book.
11.	Rene Laennec	1816	* Stethoscope. (Bamboo)
12.	Girolamo Fabrici (Italy)	1574	* Veins having small valves. * Blood always flows from left ventricle to all parts of the body. * Blood reaches hearts through veins.

"QUESTIONNAIRE" TO KNOW ABOUT .....

A. Organs (Heart, lungs, gland, kidney, mitochondria, brain, chloroplast, epiglattis, diaphrogm . . . .)

1. What is meant by _____ ?
2. What is the location of _____ ?
3. What is the size of _____ ?
4. What is the shape of _____ ?
5. What are the functions of _____ ?
6. Explain the structure of _____ ?
7. What are the differences between _____ and _____ ?
8. If _____ does not work properly what will happen ?

B. Process (photosynthesis, respiration, urine formation, excretion, dialysis, digestion, mitosis, meiosis, peristalsis . . . .)

1. What is meant by _____ ?
2. What is the process of _____ ?
3. In which place _____ takes place ?
4. What are the differences between _____ and _____ ?
5. If _____ does not takes place what will happen ?
6. What are the uses of _____ ?

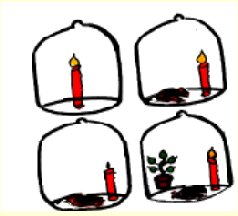
C. Diseases : (Kwashiorkor, Marasmus, Obesity, Beri beri, pellagra, Anaemia, pneumonia, haemophilia, uremia, STD, HIV, RTI, minamata . . . .)

1. What is meant by _____ ?
2. What are the symptoms of _____ ?
3. What are the causes of _____ ?
4. What are the precautions of _____ ?
5. What is the treatment of _____ ?
6. What are the preventive methods of _____ ?

DIAGRAM BASED QUESTIONS

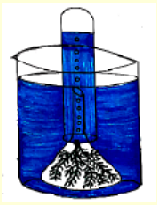
Diagram based videos

1. What is the aim of this experiment ?
2. What is the chemical taken into the test tube ?
3. Name the apparatus used in this experiment ?
4. What can be the result of this experiment ?
5. What kind of plants do we collect for this experiment ?



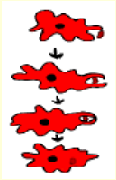
1. Who counducted this experiment ?
2. What is the condition of the burning candle and mouse when kept in a closed bell jar ?
3. What happens when a mint plant is kept in a closed jar ?
4. What is the conclusion after careful observation of this experiment?

1. What is the aim of this experiment ?
2. Identify the apparatus used in this experiment ?
3. What is the chemical used in the bottle ?
4. Why should we remove starch from the plant ?
5. What precautions do you take while conducting this experiment ?



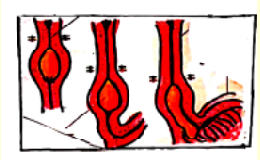
1. Which plants can be used instead of hydrilla in this experiment ?
2. What is the aim of this experiment ?
3. Name the apparatus required for this experiment ?
4. What precautions do you follow during this experiment ?
5. What can be the gas released into the test tube ? How do you identify it ?

1. What is the aim of this experiment ?
2. What are the tools required for conducting this experiment ?
3. Why is the light screen fixed to the leaf ?
4. What is the advantage of keeping the plant in dark room before conducting the experiment ?
5. What is the reason for no change in the part of the leaf where light screen arranged ?



1. What is the organism shown in the picture ?
2. What does this picture indicate ?
3. Which organs help amoeba to collect food ?
4. Where does the digested material diffuse ?

1. What is the system shown in the picture ?
2. Name the long tube which extends from mouth to the anus ?
3. Observe the picture carefully and label the parts ?
4. What are the names of glands present in this system ?



1. What does this diagram indicate ?
2. What happens when the walls of oesophagus do not secrete mucus ?
3. What is the use of this movement ?
4. What happens when this movements are in reverse direction ?

CHOOSE THE CORRECT ANSWER

Scan Q.R. for Online exam

1. NUTRITION - FOOD SUPPLYING SYSTEM

1. The organisms which can prepare their own food is called. [ ]
a. Saprophyte b. Heterotroph
c. Symbiotic d. Autotroph

2. The organism which depend on others for food is called. [ ]
a. Saprophyte b. Autotroph c. Heterotrophs d. Parasite

3. Light reaction is also called as. [ ]
a. Biosynthetic phase b. Photo chemical phase c. Carbon fixation d. Calvin cycle

4. More number of chloroplasts are found at which side of the leaf. [ ]
a. Lower side b. Air space c. Lateral side d. Upper side

5. Which part of the leaf has more chlorophyll. [ ]
a. Palisade parenchyma b. Spongy parenchyma c. Air space d. Xylem

6. The liquid filled in chloroplast is called. [ ]
a. Nucleoplasm b. Cytoplasm c. Stroma d. Serum

7. Dark reaction occurs in which part of chloroplast. [ ]
a. Grana b. Stroma. c. Thylakoid. d. All

8. If a plant is kept in a dark room which process does not takes place. [ ]
a. Respiration b. Excretion c. Photosynthesis. d. All

9. The end products of dark reaction are. [ ]
a. ATP, NADPH, O_2 b. Glucose c. NADPH d. Oxygen

10. Salivary amylase can also be called as. [ ]
a. Lipase b. Pepsin c. Ptyalin d. Secretin

11. Ptyalin digests. [ ]
a. Glucose b. Starch c. Glycogen d. Maltose

12. Bile juice is secreted from. [ ]
a. Stomach b. Small Intestine c. Liver d.Duodenum

13. Chewing of food is called. [ ]
a. Mastication b. Swallowing c. Bolus d.Chyme

14. Pancreatic juice digests. [ ]
a. Proteins b. Fats c. Carbohydrates d.All

15. The conversion of big oil drops into droplets is known as. [ ]
a.Digestion b. Emulsification c. Esterification d. All

16. The walls of small intestine secretes [ ]
a.Bile juice b. Gastric juice c.Succus entericus d.Saliva

17. The passage of undigested food from the body by the way of anus is called. [ ]
a. Excretion b. Expulsion c. Defecation d. All

18. Pepsin: Proteins:: Lipase:_____ [ ]
a.Carbohydrates b.Proteins c.Fats d.Vitamins

19. Vitamin A deficiency leads to. [ ]
a. Xerophthalmia b. Dryskin c. Night blindness d. All

20. Deficiency of folic acid leads to. [ ]
a. Anemia b. Pellagra c. Glossitis d. Rickets

21. Kwashiorkor is a _____ disease. [ ]
. a. Vitamin deficiency b. Protein malnutrition
c. Calorie malnutrition d. Protein calorie

22. In take of excess nutrients cause. [ ]
a.Kwashiorkor b.Marasmus c.Obesity d.Calorie malnutrition

MATCH THE FOLLOWING

I.

1. Mouth	[ ]	a. Chyme
2. Oesophagus	[ ]	b. Absorption
3. Stomach	[ ]	c. Bolus
4. Small intestine	[ ]	d. Defecation
5. Large intestine	[ ]	e. Peristalsis

2. RESPIRATION ... THE ENERGY PRODUCING SYSTEM

Scan Q.R. for Online exam

CHOOSE THE CORRECT ANSWER

1. The term respiration is derived from a Latin word. [ ]
a. Breathe b.Inhale
c.Respire d. Exhale

2. Gaseous exchange occurs in between blood & tissues is by. [ ]
a. Osmosis b. Absorption c.Diffusion d. Both a & b

3. The presence of Co_2 in exhaled air can be demonstrated by. [ ]
a. Lemon juice b. Hcl c. Blood d. Lime water

4. Epiglottis is under the control of [ ]
a.autonomous Nervous system b.Digestive system
c.Respiratory system d.Excretory system

5. Which organs play a very important role in respiratory movements? [ ]
a.Lungs and blood b.Ribs and diaphragm c.Lungs and diaphragm d.Blood and ribs

6. Which organs play an important role in the respiratory movements of men? [ ]
a.Ribs b.Lungs c.Diaphragm d.Nose

7. Entry of food into trachea causes? [ ]
a.Heart attack b.Vomiting c.Choking d. Suffocation

8. As the depth of the sea increases what decreases?. [ ]
a.Nitrogen b. Oxygen c. Pressure d.Water

9. The percentage of oxygen in the exhaled air. [ ]
a.16% b. 1% c. 4% d.71%

10. Which stage is common in both aerobic and anaerobic respiration? [ ]
a. Glucose b. Pyrate c. Glycolysis d. All

11. Respiration through skin is called. [ ]
a. Pulmonary respiration b.Tracheal respiration
c. Cutaneous respiration d.Branchial respiration

12. Choose the catabolic process. [ ]
a. Photosynthesis b.Growth c. Respiration d. Circulation

13. Which is an anabolic process. [ ]
a. Photosynthesis b. Digestion c. Respiration d. Excretion

14. Which is the power house of the cell. [ ]
a. Nucleus b. Mitochondria c. Chloroplast d.Cytoplasm

15. Which gas percentage increases in exhaled air comparing to inhaled air. [ ]
a. Nitrogen b. Oxygen c. Carbon dioxide d. Other gases

MATCH THE FOLLOWING

i)

1. Lungs	[ ]	a) 7,200 cal
2. Larynx	[ ]	b) Power house of the cell
3. Trachea	[ ]	c) Pleura
4. Lung capacity	[ ]	d) Wind pipe
5. Mitochondria	[ ]	e) 5800 ml
6. ATP	[ ]	f) Voice box

ii)

1. Anabolism	[ ]	a) Destructive process
2. Cristae	[ ]	b) Earth worm
3. Catabolism	[ ]	c) Mitochondria
4. Gills	[ ]	d) Constructive process
5. Skin	[ ]	e) Larva frog

10. NATURAL RESOURCES

Scan Q.R. for Online exam

CHOOSE THE CORRECT ANSWERS

1. Which irrigation techniques are used in areas with water scarcity. [ ]

a. Drip irrigation b. Bore well
c. Sprinkler irrigation d. (a) & (c)

2. Give an example for micro-irrigation. [ ]

a. Under ground water b. Furrow irrigation
c. Drip irrigation d. Basin irrigation

3. What is percentage of fresh water on our earth. [ ]

a. 2-2.5% b. 2.5-2.75% c. 2.75%-3% d. 1-1.75%

4. Sriram project is constructed on which river. [ ]

a. Krishna b. Brahmaputra c. Godavari d. Kaveri

5. How much of the cultivable land around the world is irrigated by drip irrigation. [ ]

a. 5% b. 10% c. 4% d. 2%

6. Drip irrigation can reduce water consumption by. [ ]

a. 70% b. 50% c. 40% d. 20%

7. What is the major source of irrigation in A.P and Telangana? [ ]

a. Rain water b. Underground water c.Rivers d. Lakes

8. When we develop using the resources and ensuring their availability for future it is called. [ ]

a. Future planning b. Social development
c. Economic development d. Sustainable development

9. Forests are the lungs of. [ ]

a. Soil b. Earth c. Humans d. Living things

10. Instead of cutting trees to prepare paper we can use a type of grass known as. [ ]

a. China grass b. Bamboo c. Straw d. None

11. Variety of living things that populate the earth is known as. [ ]

a. World b. Flora c. Fauna d. Bio diversity

12. Which of the following practice is suitable for farmers with less water re sources. [ ]

a. Growing paddy b.Growing maize
c.Using drip irrigation d. Both (b) & (c)

13. Using resources with care is called. [ ]

a. Resource caring b. Resource conservation
c. Resource management d. Both (b) & (c)

14. Choose the right option matching. [ ]

i) Renewable	[ ]	a. Saves water
ii) Drip irrigation	[ ]	b. Bunds
iii) Percolation tank	[ ]	c. Soil
iv) Gliricidia	[ ]	d. Recharge underground water

a. i-b, ii-c, iii-a, iv-d b. i-c, ii-a, iii-d, iv-b
c. i-c, ii-a, iii-b, iv-d d. i-a, ii-c, iii-b, iv-d

ANSWERS FOR SPECIAL BITS

1. NUTRITION

1.Photosynthesis, 2.Villi, 3.Dodder(CUSCUTA RELENA), 4.B-pairs-parotial gland ,sub-lingual glandsub mandibular gland 5.ATP (ADENOSINE TRI PHOSPHATE) 6.Fungi - Breadmould,yeast,mushroom etc 7.B,Vitamin-biotin 8.Haustoria 9.pesupodia 10.Obesity 11.1.glucose($c_6H_{12}O_6$) 2.Oxygen(o_2) 3.Water(h_2o) 12.Marasmus 13.Chlorophyll 14.Vitamin B_{12} (CYANOCOBALAMIN) 15.Vitamin A-blue-green , B-yellow- green 16.Magesium(Mg) 17.One 18.Delay in blood cloting (OR) Over bleeding. 19.co_2,o_2. 20.CO_2 ,H_2O,Chloroplast,light 21.Bile juice 22.Carbohydrates- glcucose Proteins - amino acids Fats - Fatty acids & glycerol. 23.Green leaf 24.Peniciousanaemia 25.Two phases 1.Light dependent reaction (PHOTO CHEMICAL PHASE) 2.Light independent raction (BIO SYNTHETIC PHASE) 26.Photon 27.Around 250-400. 28.Pelletier and caventou in 1817 29.Choloroplast 30.Juliusvon sachs in 1883 31.Robert hills 32.Hydrogen ions (H^+) and Hydrogen ions (OH^-) 33.B3 (niacin) 34.Stroma 35.Pepsin,trypsin,peptidase 36.Lavoisier in 1775 37.About 40-100 38.Plants,algae,photosynthetic,bacteria 39.Animals 40.Lice,Leech,Tape,Worm,Cuscuta plant. 41.Kwashiorkor 42.Vitamin-A (restinal) Vitamin-B (Calciferol) Vitamin-E (Tocofreol) Vitamin-K (Phylloquinone) 43.Ribulose 1-5 Bis Phosphate 44.Duodenum 45.Vitamin B_1(Thianin) 46.Joseph priesty in 1774 47.Hydrilla,Elodea 48.Alkakine 49.iodine (OR) Betadine 50.Grana Thylakoids (GRANUM) 51.ATP,NADPH and Oxygen 52.Ptyalin (SALIVARY AMYLASE) 53.Ptylin,Amylase,Sucrase 54.lipase 55.Emulisification 56.Absorption 57.Hydrochroric acid(HCL) 58.Digestion 59.vitamin D 60.Ingestion 61.Liver 62.Vomiting 63.Malnutrition 64.Marasmus 65.Vitamin-B complex and Vitamin-c 66.Vitamin-c (ASCOROBIC ACID) 67.Glossitis 68.Defecation 69.Eye diseases: 1.Night blindness 2.Xeropthalmia 3.Cornea failure 70.C.B.Van neil 71.ATP and NADPH 72.Fibers (ROUGHAGES) 73.Granum 74.Vitamin-C(ASCORBIC ACID) 75.plyoric Sphincter 76.Gastric juice 77.kOH (POTASSIUM HYDROXIDE) 78.VitaminD(CALCIFEROL) 79.$6CO_2+12H_2O$ 80.Chlorophyll 81.Peristaltic movements 82.Vitamin-E(TOKOFEROL) 83.Villi 84.Joseph priestly 85.Glossitis 86.Vitamin-C(ASCORBIC ACID) 87.Chyme 88.Small intestine 89.Succus entericus 90.Methylated spirit 91.Light independent reaction(BIO SYNTHETIC PHASE) 92.Engelman 93.Starch 94.Stomata 95.Folic acid 96.Cytostome 97.Mastication 98.Stroma 99.Photolysis (OR) Hill's reaction 100.Co_2+2h_20 ----> $Ch_2o+h_2o+o_2$

2. RESPIRATION

1.Respiration 2.Aerial roots (PNEUMATOPHORES) 3.Mitochondria 4.Latin 5.To breath 6.alveoli 7.Rcaobinson and Lavoisier 8.Pleura 9.John daper in mid 19th century 10.Diffusion 11.Diaphragm 12.Nasal cavity 13.Epiglottis 14.Diazine green (OR) Janus green B 15.Cutaneous respiration 16.Carbon dioxide 17.Larynx 18.Pharynx 19.Aerobic respiration 20.Anaerobic respiration 21.0.03% and 4.4% 22. Fishes,Prawns,Crabs 23.ATP 24.Diaphragm 25.Cyptoplasm 26.7200 Calories (OR) 7.2 Kilo calories 27.Phosphate Bonds 28.Cristae 29.Alveoli and blood capillaries 30.Oxygen(O_2) 31.Pharynx 32.Carbon dioxide 33.21% and 16% 34.Lenticels 35.Diffusion 36.Trachea 37.Branchial respiration 38.Gills 39.Pulmonary respiration 40.Mammals,Birds,Reptiles,Amphibions 41.Cutaneous(SKIN),Pulmunary(LUNGS) and Bucco naryngeal cavity 42.Gills 43.Stomata 44.Bacteria,Yeast and sometimes in muscle cells 45.Glycolysis 46.ADP and Phosphate 47.Leech,Earthworm,Frog. 48.Guard cells 49.Due to formation of latic acid in muscles 50.Latic acid/ Ethanol+CO_2

3. TRANSPORTATION

1.Heart 2.Fist of the person 3.Pear shape 4.Thalassemia 5.4 valves,They are 1.pulmonary valves 2.Bicuspid/mitral valve 3.Tricuspid valve 4.Systemic/Aoritc valves 6.Due ro forcibly closing the tri cuspid and biscuspid valve on systolic phase 7.Due to opening the tricuspid and biscuspid

ANSWERS FOR ONE WORD QUESTIONS

1. NUTRITION

1. C.B. Van Neil **2.** Iodine **3.** Lavoisier **4.** CO_2 , sunlight, chlorophyll & water
5. starch is removed due to lack of sunlight **6.** KOH (potassium hydroxide)
7. Red & Blue **8.** Hydrilla (or) Elodea **9.** Leaves **10.** Magnesium molecule
11. Engelman **12.** photo means light, lysis means breaking **13.** Robert Hill
14. Pelletier and Caventou **15.** ATP & NADPH **16.** Grana of chloroplasts
17. Adenosine Tri Phosphate **18.** stomata **19.** cuscuta, lice, leech and tapeworms
20. Ribulose Biphosphate **21.** Body surface **22.** Pseudopodia
23. It is a leafless plant **24.** to penetrate into the tissue of the host plant
25. convolvulaceae **26.** Breaking down of complex substances into simple ones with the help of enzymes
27. Amylase (or) ptyalin **28.** HCl (Hydrochloric acid)
29. wave like movements in oesophagus **30.** pyloric sphincter **31.** Bile Juice
32. Finger like projections in the small intestine. They increase the surface area for absorption
33. Marasmus **34.** Kwashiorkor **35.** B-complex & vitamin C **36.** A,D,E & K
37. Night blindness, xeropthalmia, cornea failure **38.** Vitamin C (Ascorbic acid)
39. Niacin (B_3) **40.** K (phylloquinone) **41.** B_{12} (cyanocobalamin)

2. RESPIRATION

1. carbon dioxide and water vapour **2.** carbon dioxide **3.** pharynx **4.** larynx
5. Epiglottis is a flap like muscular valve. It controls movement of food & air towards their respective passages **6.** Alveoli **7.** Alveoli **8.** Pleura **9.** Diaphragm helps the lungs in moving air into & out of them **10.** Ribs **11.** Iron **12.** Cytoplasm **13.** Cytoplasm and mitochondria **14.** CO_2 and H_2O **15.** Lactic acid/Ethanol, CO_2
16. Anaerobic respiration in Bacteria **17.** ATP **18.** 7200 calories
19. Accumulation of Lactic acid **20.** Oxygen debt **21.** Diazine green (or) Janus Green B solution
22. combustion process **23.** Diffusion **24.** Insects Ex: cockroach, grasshopper
25. stomata (leaves), & Lenticels (stem) **26.** Heat **27.** Aerial roots **28.** In the form of ATP
29. Chloroplast **30.** Mitochondira **31.** Respiration through lungs
32. Temperature, humidity, Light intensity

3. TRANSPORTATION

1. Diffusion, osmosis **2.** Rene Laennec **3.** Pericardial membranes
4. pericardial fluid **5.** 4 **6.** Aorta **7.** Bicuspid (or) Mitral valve **8.** William Harvey, Mammals
9. Girolama Fabrici **10.** Marcello Malpighi
11. One contraction & one relaxation of atria and ventricles called **12.** 0.8 second
13. If blood flows through the heart only once it is called single circulation
14. Double circulation **15.** Lymph
16. The liquid portion after formation of blood clot is called serum
17. Protoplasm shows natural movement called brownian movement
18. Cnidarians (Ex. Hydra and Jelly fish) **19.** Animals belonging to Nemathelemnthis
20. Open type of circulatory system Ex: Arthropods
21. If the blood flows in the blood vessels is called closed type of circulatory system. Ex. Annelids and chordates **22.** Sphygmomanometer
23. $\frac{120}{80}$ 120 indicates systolic pressure, 80 indicates diastolic pressure **24.** People who have high B.P during resting period are said to have hypertension
25. Platelets **26.** Thrombrokinase enzyme and Vitamin K
27. Haemophilia is a disorder in which the blood may not coagulate due to genetic disorder.
28. Thalassemia **29.** Water through xylem and food through phloem. **30.** Phloem

THINKING SKILLS - OBJECTIVE TYPE - ANSWERS

Arrange the following in a sequential order

1. G_1 phase, S phase, G_2 phase, M phase
2. Stomach, Duodenum, Small intestine, Rectum
3. Vasa efferentia, Epididymis, Vasa deferentia, Ejaculatory duct
4. Diopithicus, Ramapithichus, Astrolopithicus, Homo habilus
5. Prophase, Metaphase, Anaphase, Telophase
6. Pharynx, Larynx, Trachea, Bronchus, Bronchioles, Alveolus
7. Sensory organ, Afferent nerve, Association nerve, Efferent nerve, Muscle
8. Glomerular filtration, Tubular reabsorption, Tubular secretion, Formation of urine
9. Auricles, Ventricles, Aorta, Body parts
10. select potted plant, Keep the plant in dark room, Cover the leaf with black paper, Place the potted plant in sun light.
11. Fertilisation, Zygote, Embryo, Fruit, Seed.
12. Activation of chlorophyll, Photolysis, Formation of ATP & NADPH, Formation of Glucose.
13. Ingestion, Digestion, Absorption, Defecation.
14. Breathing, Gaseous exchange at lungs level, Gas transport by blood, gaseous exchange at tissue level, Cellular respiration .
15. Glomerulus, PCT, Loop of Henle, DCT, Collecting tube.
16. Kidney, Ureters, urinary bladder, urethra.
17. sepals, petals, Stamens, carpels.
18. phyto plankton, zoo plankton, Fish, Man.
19. Ovary, Fallopian tube, Uterus, Vagina.
20. Grass, Grasshopper, Frog, Snake, Hawk.

Give Examples

1. Mushrooms & Bread moulds 2. Lice, Leech, tapeworm & cuscuta 3. Pepsin & Trypsin 4. Kwashiorkor & Marasmus 5. B,C 6. A, D, E, K 7. Cockroach, Grasshopper 8. Fishes 9. Birds, Mammals 10. Earthworm, starfish 11. carbohydrates, proteins and fats 12. Alkaloids, Tannins, Resins 13. Quinine, Nicotine, Caffeine 14. Cassia, Acasia 15. Pitutory gland, Pancreas 16. Auxins, cytokinnins 17. Mimosa pudica 18. Paramoecium, bacteria 19. Algae & fungi 20. Jasmine, Strawberry 21. Rose, Hibiscus 22. Mango, Citrus, apple 23. Gonorrhoea, syphilis, AIDS 24. Cow, buffalo 25. Forelimb of a whale, wing of a bat 26. wings of birds, wings of bats 27. carbon, uranium 28. pinna, hair on skin, mammary glands 29. Diarrhoea, typhoid, amoebiasis 30. pesticides containing mercury, lead 31. Lead (Pb), cadmium (Cd), Chromium (Cr), Manganese (Mn) 32. Leguminous plants Ex: Gliricidia 33. Air, Water, Sunlight 34. Coal, Petroleum, Natural gas 35. contour strip cropping

Read the sentence, find the error & rewrite it

1. Respiration 2. Magnesium 3. Hydroxyl 4. Niacin (B_3) 5. Mangrove plants 6. out of the lungs 7. vasopressin 8. serum 9. cortex 10. cell body 11. Endocrine glands 12. Medulla oblongata 13. 8 nuclei 14. chyme 15. Bioaccumulation 16. Tricuspid valve 17. veins 18. precaval vein 19. Meiosis 20. Adrenalin 21. Ghrelin 22. Natural selection 23. Heredity 24. Biomass

MULTIPLE CHOICE ANSWERS

1. NUTRITION - FOOD SUPPLYING SYSTEM

MULTIPLE CHOICE ANSWERS

1. d 2. c 3. b 4. d 5. a 6. c 7. b 8. c 9. b 10. c
11. b 12. c 13. a 14.d 15. b 16.c 17. c 18. c 19. d 20. a
21. b 22. c

MATCHINGS : I. 1. c 2. e 3. a 4. b 5. d

2. RESPIRATION...THE ENERGY PRODUCING SYSTEM

MULTIPLE CHOICE ANSWERS

1. c 2. c 3. d 4. a 5. b 6. c 7. c 8. b 9. a 10. c
11. c 12. c 13. a 14. b 15. c

MATCHINGS : I. 1. c 2. f 3. d 4. e 5. b 6. a
II. 1. d 2. c 3. a 4. e 5. b

3. TRANSPORTATION . . . THE CIRCULATORY SYSTEM

MULTIPLE CHOICE ANSWERS

1. c 2. a 3. d 4. b 5. d 6. b 7. b 8. a 9. b 10. b
11. c 12. c 13. c 14. d 15. a 16. c 17. a 18. d 19. c 20. b
21. a 22. d 23. d 24. b 25. d 26. d 27. c

MATCHINGS : I. 1. d 2. a 3. b 4. c
II. 1. c 2. d 3. b 4. a

4. EXCRETION - THE WASTAGE DISPOSING SYSTEM

MULTIPLE CHOICE ANSWERS

1. a 2. b 3. c 4. c 5. c 6. d 7. b 8. c 9. c 10. a
11. b 12. d 13. c 14. b 15. c 16. b 17. a 18. a 19. d 20. c

MATCHINGS : I. 1. e 2. d 3. a 4. b 5. c

5. CO-ORDINATION - THE LINKING SYSTEM

MULTIPLE CHOICE ANSWERS

1. c 2. a 3. c 4. c 5. b 6. d 7. b 8. c 9. c 10.a
11. b 12. c 13. b 14. a 15. c 16. b 17. a 18. a 19. a 20. b
21. c

6. REPRODUCTION - THE GENERATING SYSTEM

MULTIPLE CHOICE ANSWERS

1. b 2. d 3. d 4. d 5. d 6. d 7. d 8. b 9. a 10. b
11. c 12. d 13. b 14. b 15. c 16. b 17. c 18. c 19. a 20. b

MATCHINGS : I. 1. c 2. d 3. b 4. e 5. a

7. CO-ORDINATION IN LIFE PROCESSES

MULTIPLE CHOICE ANSWERS

1. c 2. c 3. c 4. a 5. a 6. b 7. a 8. b 9. a
10. c 11. d 12. a 13. d 14. c 15. d 16. b 17. a 18. a

MATCHINGS : I. 1. e 2. c 3. d 4. b 5. a

8. HERIDITY - FROM PARENT TO PROGENY

MULTIPLE CHOICE ANSWERS

1. b 2. a 3. b 4. c 5. d 6. d 7. c 8. b 9. d
10. b 11. c 12. a 13. b 14. c 15. b 16. c 17. d 18. c
19. b 20. d 21. c 22. b 23. a 24. b

9. OUR ENVIRONMENT - OUR CONCERN

MULTIPLE CHOICE ANSWERS

1. c 2. d 3. b 4. d 5. a 6. c 7. b 8. d 9. d
10. b 11. c 12. b 13. c 14. b 15. d 16. b 17. c

10. NATURAL RESOURCES

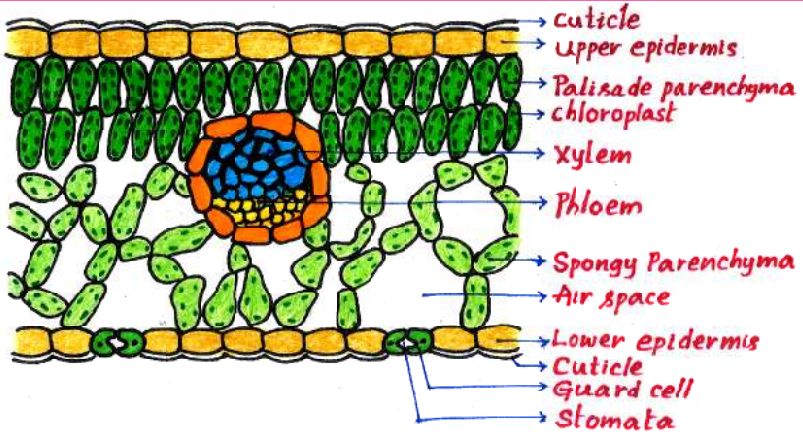
MULTIPLE CHOICE ANSWERS

1. d 2. c 3. b 4. c 5. d 6. a 7. b 8. d 9. b 10.b
11.d 12. c 13. d 14.b

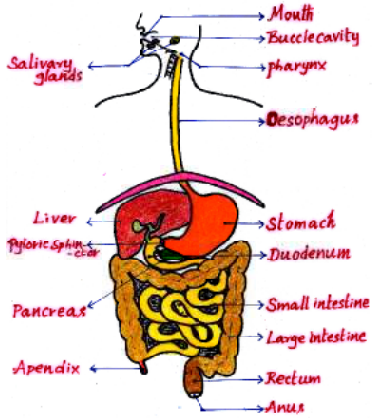
IDENTIFY THE PARTS OF DIAGRAMS

Identifying the parts of Diagrams pl.scan QR

TRANSVERSE SECTION OF LEAF



DIGESTIVE SYSTEM



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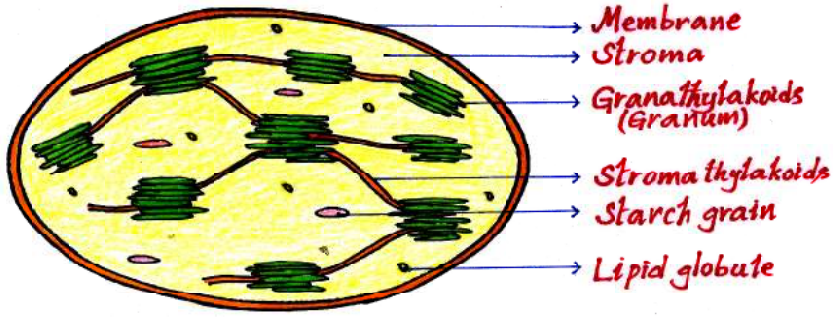
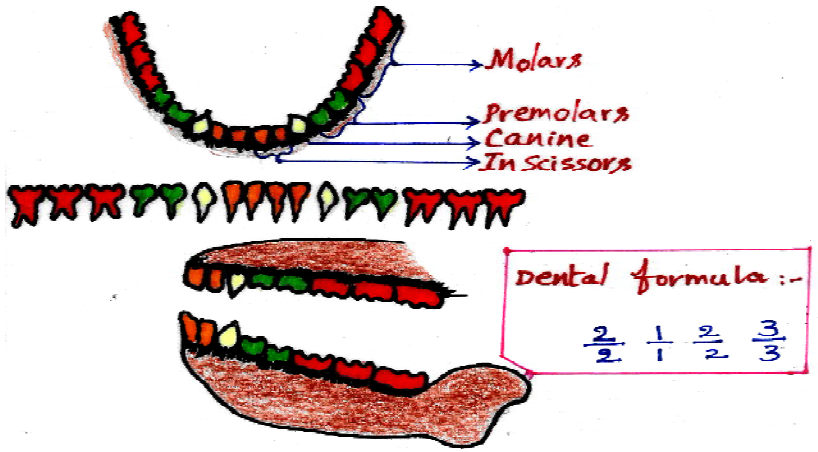
CHLOROPLAST

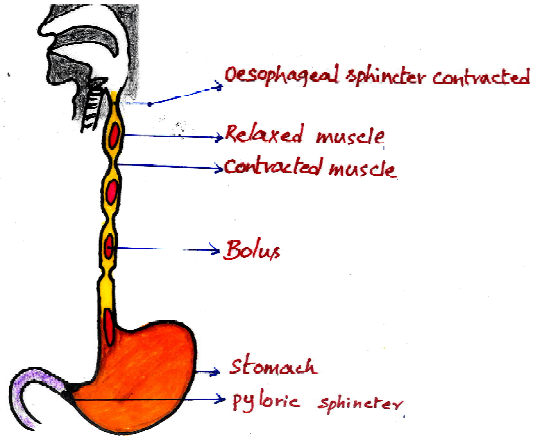


DENTITION

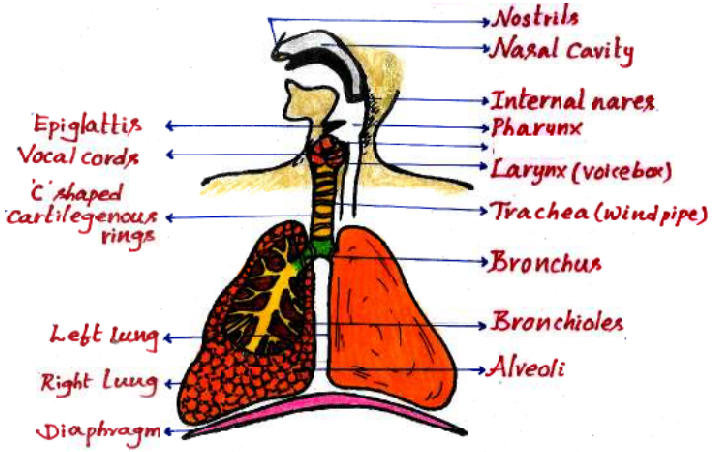


IDENTIFY THE PARTS OF DIAGRAMS

PERISTALTIC MOVEMENT OF BOLUS



RESPIRATORY SYSTEM



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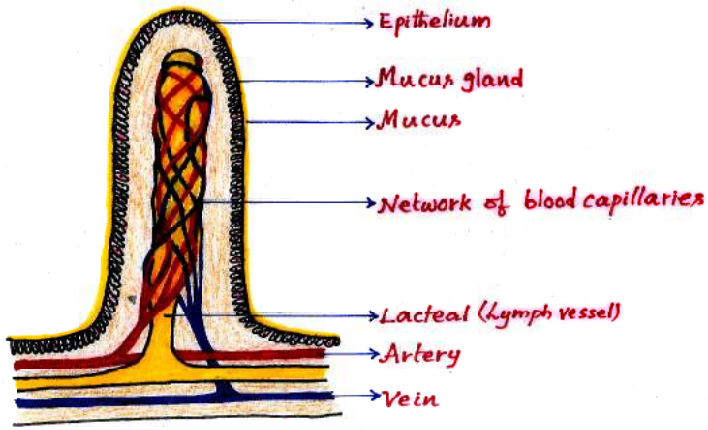
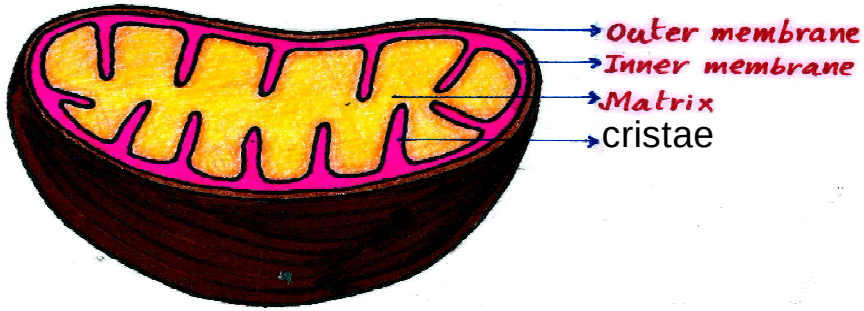
VILLI

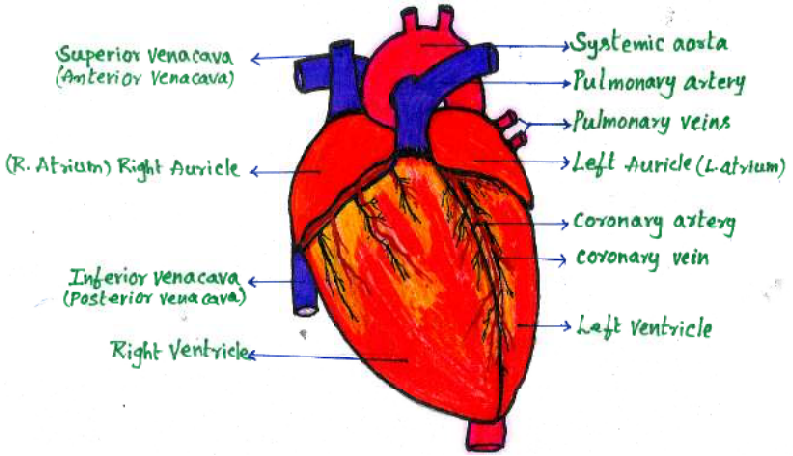


MITOCHONDRIA

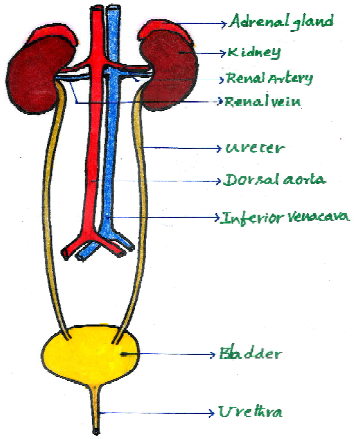


IDENTIFY THE PARTS OF DIAGRAMS

HEART



EXCRETORY SYSTEM



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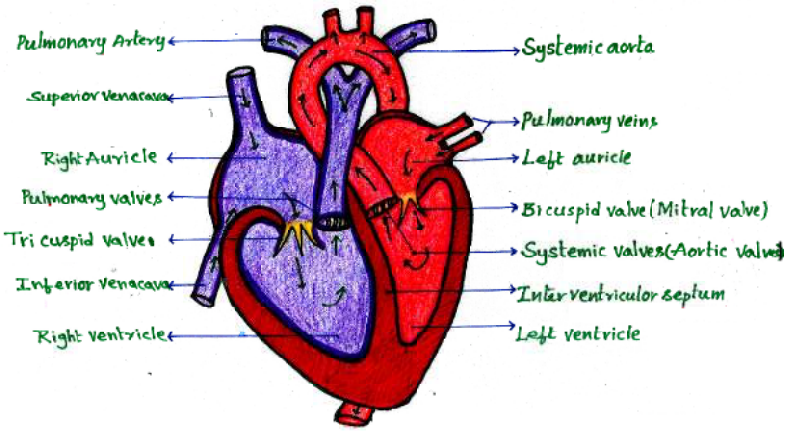
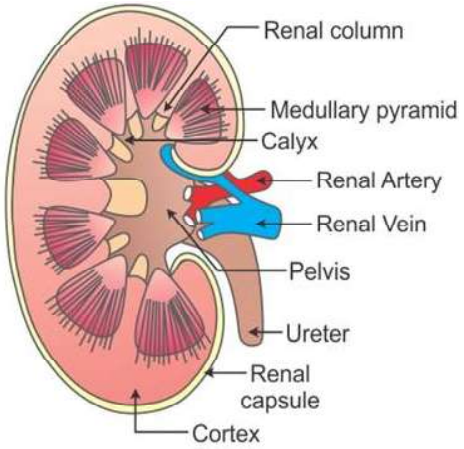
INTERNAL STRUTURE OF HEART

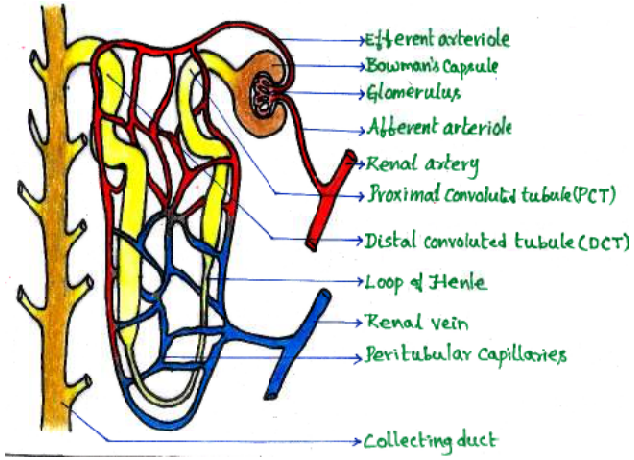


LONGITUDINAL SECTION OF KIDNEY

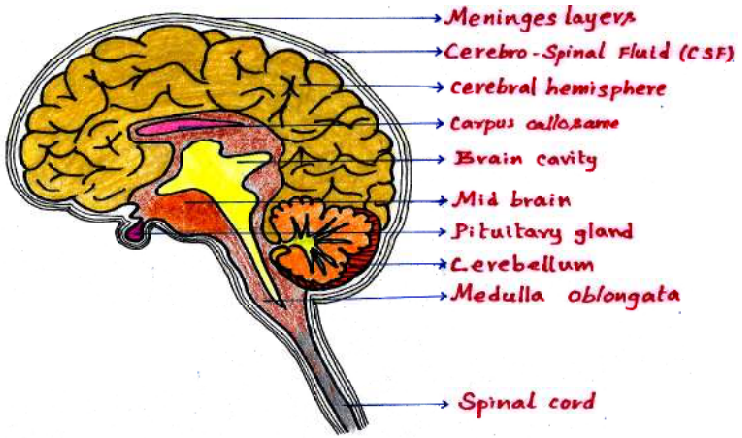


IDENTIFY THE PARTS OF DIAGRAMS

NEPHRON



Structure of BRAIN



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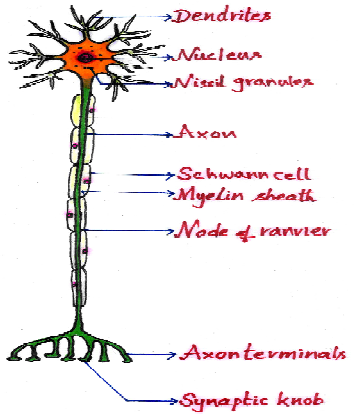
NEURON NERVE CELL



REFLEX ARC