**BUDHA DAL PUBLIC SCHOOL PATIALA ANNUAL PEDAGOGY SESSION 2023 – 2024.**

**CLASS: XI SUBJECT: PHYSICS**

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| **TOPIC** | **INNOVATIVE/ART INTEGRATION/EXPERENTIAL LEARNING/INTER-DISCIPLINARY** | **Expected Learning Outcomes** |
| **Kinematics.**Frame ofreference, Motionin a straight line:Position-timegraph, speed andvelocity.Elementaryconcepts ofdifferentiation andintegration fordescribing motion.Uniform and non-uniform motion,average speed andinstantaneousvelocity.Uniformlyacceleratedmotion, velocity-time and position-time graphs.Relations for uniformly accelerated motion(graphicaltreatment) | **EXPERENTIAL LEARNING**Examples from daily life will be given to explain rest and motion and various type of motion like 1D, 2D and 3D.ART INTEGRATION drawing of diagrams and graphs. INTERDISCIPLINARY Integrated with English and mathematics. | Students will learn● to differentiatebetween onedimension, twodimension and threedimensional motion.● the concept ofuniform, non-uniformand acceleratedmotion.● the concept ofaverage speed,instantaneous speed.● the differencebetween speed andvelocity.● the projectile motion, maximumRange, height and timeof flight.● the uniform and nonuniform circularmotion. |
| **Vectors/****Basic**mathematicalconceptsScalar and vectorquantities;Position anddisplacementvectors, generalvectors and theirnotations; equalityof vectors,multiplication ofvectors by a realnumber; additionand subtraction ofvectors. Unitvector; Resolutionof a vector in aplane - rectangularcomponents.Scalar and Vectorproduct of vectors. | **EXPERENTIAL LEARNING**Activity based on parallelogram law of vectors will be demonstrated to find unknown weight.ART INTEGRATION drawing of diagrams and graphs. INTERDISCIPLINARY Integrated with English and mathematics. | Students will learn the concept of scalar andvector quantities● the concept of dot andcross product of twovectors.● the triangle, polygonand parallelogramlaws of vectors |
| **Physical world and measurement**Types of physical quantities, fundamental and derived units, dimensional analysis,error analysis. | **EXPERENTIAL LEARNING** Giving examples of fundamental quantities from daily life like mass, length , time and temperature.**ART INTEGRATION** Drawing of diagrams in parallax method.**INTERDISCIPLINARY** Integrated with English and mathematics | Students will learn about the difference between fundamental and derived quantities and also between accuracy and precision. |
| **Laws of Motion**- force (balancedand unbalancedforce) and motion,Newton’s laws andits applications,inertia,momentum,Impulse, law ofconservation oflinear momentum.Connected pulliesand elevatorproblems, | **EXPERENTIAL LEARNING**Activity based on finding coefficient of friction will be demonstrated to find unknown µ using inclined plane and horizontal plane apparatus.ART INTEGRATION drawing of diagrams and graphs. INTERDISCIPLINARY Integrated with English and mathematics. | Student will learnconcept of force anddifference betweenbalanced andunbalanced forces.● They have learned theconcept of inertia andits type.● They have learned thekeys of Newton’slaws.● They have learned theto formulate theNewton’s second lawof motion.● They have learned theconcept of momentumand impulse.● They have learned theconcept and types ofcollision.● and Momentum ofbody. They have learned theapplication of inertiaof rest and motion inday to day life● They have learned theapplication andconcept of Newton’slaws in daily actions |
| **Work power andEnergy.**Work done by aconstant force andvariable force,kinetic energy,work energytheorem, power.Notion of potentialenergy, potentialenergy of a spring,conservativeforces,conservation ofmechanicalenergy, nonconservativeforces, elastic andinelastic collisionsin one and twodimensions. | **EXPERENTIAL LEARNING**By demonstrating theactivity using springbalance and bob thepotential energy stored inan object will be explained.And by law of conservationof energy the speed of anobject when falling from acertain height will becalculated and using thevalue of speed kineticenergy will be calculated.ART INTEGRATION drawing of diagrams and graphs. INTERDISCIPLINARY Integrated with English and mathematics | **Students** will learn● The concept Workdone by a constantforce and variableforce● The application of lawof conservation ofenergy.● To differentiatebetween elastic andinelastic collision.● Different types ofwork done |
| **Centre of massand RotationalMotion** andcentre of mass oftwo-particlesystem,momentumconservation andcentre of massmotion, centre ofmass of rigid body,centre of mass ofuniform rod.Vector product ofvectors, moment offorce, torque,angularmomentum,conservation ofangularmomentum withsome examples.Equilibrium ofrigid bodies,comparison oflinear androtational motion,moment of inertiaand radius ofgyration. Values ofmoments of inertiafor simplegeometrical object,statement of parallel and perpendicular axestheorem and theirapplications | **EXPERENTIAL LEARNING**Using C.D. and ring moment ofinertia and centre of mass willbe demonstrated.ART INTEGRATION drawing of diagrams and graphs. INTERDISCIPLINARY Integrated with English and mathematics. | Students will be able to learn• The concept centreof mass motion,centre of mass ofrigid body• The comparison oflinear androtational motion• The concept of• moment of inertia• the concept ofmoment of inertia.• The concept oftorque andapplications oftorque-- |
| **Gravitation**Kepler’s laws ofplanetary motion.The universal lawof gravitation,Acceleration dueto gravity and itsvariation withaltitude and depth,gravitationalpotential energy,gravitationalpotential, Escapevelocity, criticalvelocity, orbitalvelocity of asatellite.Geostationarysatellite | **EXPERENTIAL LEARNING** Determination ofacceleration due togravity by simplependulum• Using pendulum ofdifferent masses,verification of lawsof time period -ART INTEGRATION drawing of diagrams and graphs. INTERDISCIPLINARY Integrated with English and mathematics. | Students willlearn• How thelaunching ofsatellite is done• Variation inacceleration due ogravity with heightand depth.• Potential andgravitationalpotential energy.• How the energy ofsatellite iscalculated |
| **Properties of****Matter:** 1. Solids-Elastic behavior ofsolids, stress,strain, elastic limit,Hook’s law,Modulus ofelasticity, potentialenergy in astarchedwire,poisson;sratio, thermalstress2.Hydrostatics (fluidsat rest); Pressureof liquid,applications ofconcept ofpressure, density,hydrostaticparadox, Pascal’slaw, Atmosphericpressure,Buoyancyintermolecularforces, importantterms related tosurface tension,surface energy,excess pressure,angle of contact,capillarity, ascentformula.3.Hydrodynamics;viscosity,Poiseuille’sformula, Stoke’slaw, terminalvelocity,streamlineturbulent andLaminar flow,critical velocity,Reynold’s number,equation ofcontinuity,Bernoulli’stheorem, Bloodpressure. | **EXPERENTIAL LEARNING**Activities• Determination ofcoefficient of viscosity ofglycerin by estimatingterminal velocity• Determination of Young’smodulus of elasticity bySear’ls apparatusART INTEGRATION drawing of diagrams and graphs. INTERDISCIPLINARY Integrated with English and mathematics |  Students will learn the concept ElasticityThe application ofPascal’s law.• The concept ofsurface tension ofliquid, surfaceenergy• The applicationsBernoulli’s theorem•  |
| **Thermodynamicsand KTG**Thermalproperties ofmatter; Heat,Temperature,thermal expansion,types of thermalexpansion, Anomalousexpansion ofwater, expansionof gases, Specificheat capacity,water equivalent,change of state,latentThermalequilibrium,Zeroth law ofthermodynamics,thermodynamicstate variables andequation of state,indicator diagramor p-v diagram,isothermal change,Adiabatic change,slopes and workdone of isothermaland adiabaticchanges, isobaricand isochoricchanges, first lawofthermodynamics,Applications of thefirst law ,cuclicand non-cyclicprocess second law ofthermodynamics.gases -assumptions,concept ofpressure. Kineticinterpretation oftemperature; rmsspeed of gasmolecules; degreesof freedom, law ofequipartition ofenergy (statementonly) andapplication tospecific heatcapacities of gases;concept of meanfree path, | **EXPERENTIAL LEARNING**Verification of Newton’s law ofcooling can be demonstrated.ART INTEGRATION drawing of diagrams and graphs. INTERDISCIPLINARY Integrated with English and mathematics | Students have learnt the meaningofthermodynamics The conceptof isothemalprocess andadiabaticprocess.• The principleThermal propertiesof matter, Heat,Temperature,• Anomalousexpansion of water,expansion of gases,• Specific heatcapacity, waterequivalent,• change of state,latent heat,calorimetric, twoprincipal specificheats of gas |
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| **Oscillations andWaves**Periodic motion -time period,frequency,displacement as afunction of time.Periodic functions.Simple harmonicmotion (S.H.M)and its equation;phase; oscillations of a spring–restoring force andforce constant;energy in S.H.M.Kinetic andpotential energies;simple pendulum–derivation ofexpression for itstime period.Free, forced anddampedoscillations(qualitative ideasonly), resonance.Wave motion.Transverse andlongitudinalwaves, speed ofwave motion.Displacementrelationfor a progressivewave. Principle ofsuperposition ofwaves, reflectionof waves, standingwavesin strings andorgan pipes,fundamental modeand harmonics,Beats, | **EXPERENTIAL LEARNING**• Concept of periodic motionand oscillations with thehelp of simple pendulum.• Formation of stationarywaves by sonometer• Formation of stationarywaves by resonance column.ART INTEGRATION drawing of diagrams and graphs. INTERDISCIPLINARY Integrated with English and mathematics. | Students will have learnt -• the concept of Periodicmotion• time period, frequency,• Free, forced and dampedoscillations• Wave motion.Transverse andlongitudinal waves,speed of wave motion.Displacement relation• Principle ofsuperposition of waves. reflection of waves,standing• Understand Principle ofsuperposition of waves,reflection of waves,standing waves in stringsand organ pipes,fundamental mode andharmonics, Beats,Doppler effec |