GradePod
ACE YOUR EXAMS

100 Internal Assessment Ideas for IB Physics

You Can Do It!

"I've been teaching physics for 18 years and the key mistake is agonising too much over your topic. **Just pick one and you're nearly there!**

I've split the 100 ideas out into topics. Decide which topic you've most enjoyed studying so far and head to that section.

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Physics Geek and CEO GradePod

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Physics IA Ideas: Mechanics

- How does the temperature of a tennis ball affect the coefficient of restitution of the tennis ball?
- How does the length of a bridge affect the sag of a bridge when a constant mass is applied to the centre of the bridge?
- How does the breadth of a flat bridge affect the vertical depression/sag produced when a known mass is added?
- How does the mass of falling coffee filters affect the terminal velocity of the coffee filters?
- How does the mass of a toy parachute affect the terminal velocity?
- How does the radius of a toy parachute affect the terminal velocity?
- How does the angle of release of a golf club affect the distance travelled by the ball?
- How does the volume of an object affect the bouyancy when fully submerged in water?
- How does the angle of release of a single pendulum affect the deviation of time period from that predicted by a simple pendulum?
- How does temperature affect the spring constant of a spring?
- How does the temperature affect the range of flight of an elastic band?
- How does temperature of a copper wire affect the Young Modulus?
- How does the cross-sectional area of blades affect the lift force of a toy helicopter?
- How does the angle of blade affect the lift force of a toy helicopter?
- How does the number of blades affect the lift force of a toy helicopter?
- How does the cross-sectional area of a football affect the terminal velocity?
- How does the cross-sectional area of a sail on a toy boat affect the initial acceleration?
- How does the radius of a football affect the impulse on the football when kicked?
- How does the mass added to an inflated balloon affect the terminal velocity of the falling balloon?

- How does the paddle area of a waterwheel affect the efficiency of the waterwheel when converting into electrical energy?
- How does the temperature of grease affect the depth of crater created when a mass is dropped from a known height?
- How does the height of a ramp affect the time taken for a cylinder to roll down the ramp?
- How does the angle of a ramp affect the time taken for a block to reach the bottom of the ramp?
- How does the mass of a block affect its recoil distance after being impacted by a constant external force?
- How does the temperature of rubber affect the coefficient of static friction between the rubber and a surface?
- How the temperature of a lubricant applied to the bottom of a solid affects the coefficient of dynamic friction when the solid is pulled along a surface?
- How does the mass of a ball bearing affect the energy loss in a pendulum system when it is released from 90 degrees and collides with a wall?
- How does the mass of a bullet in a ballistic pendulum affect the maximum height reached by the pendulum, once the bullet has embedded?
- How does the diameter of a canonball affect the time taken to reach the ground, assuming a constant drag coefficient? (good for simulation)
- How does the diameter of a ball in freefall affect the coefficient of restitution after one bounce on a hard surface? (good for simulation)
- How does the angle of initial release of a pendulum affect the subsequent calculation of ‘g’ from the pendulum?
- How does the rotational velocity of a basketball affect the horizontal travel distance when the basketball is released in freefall? (Magnus Effect)
- How does the pressure of a tyre affect the coefficient of dynamic friction?
- How does the distance that an external force is applied to a cantilever affect the vertical depression of the cantilever?

Physics IA Ideas: Thermal Physics

- How does the distance between panes of glass in double glazing affect the rate of heat loss?
- How does the number of panes of glass in double/triple/quadruple glazing affect the rate of heat loss?
- How does the change in temperature of a copper rod affect it's length of extension?
- How does the concentration of salt in water affect the specific heat capacity?
- How does the temperature of an ideal gas affect the average rate of wall collisions within a container? (good for simulation)
- How does the volume of water affect the rate of colling when subjected to a controlled breeze?
- Determine a numerical value for the gas constant

Physics IA Ideas: Waves and Oscillations

- How does light absorption through a glass plate change when more glass plates are added?
- How does the thickness of factor 30 SPF affect the intensity of UV light after it has penetrated through a constant thickness plexiglass screen?
- How does sugar concentration affect the refractive index of sugar water solution?
- Prove that the inverse square law is true for a point source light bulb and not true for a directional light source
- How does temperature affect the speed of sound in a solid (or liquid)?
- How does the length of a guitar string affect the sustain time of producing a sound, when the string is plucked with a constant force?
- How does the temperature of a guitar string affect the frequency produced when plucked at a constant force and left to vibrate freely?
- How does the diameter of a string effect the fundamental frequency?
- How does the density of a string effect the fundamental frequency?
- How does the refractive index of a material affect the intensity of light reflected from the boundary? (Good for simulation)
- How does distance from a speaker affect the sound intensity level?

Physics IA Ideas: Electricity and Magnetism

- How does the temperature affect the internal resistance of a battery?
- How does the height of a water tube (5 different measurements of height) affect the power delivered by the falling water in an electrical energy generator?
- How does the magnetic field strength of magnets affect the efficiency of an electric motor?
- How does the number of coils affect the efficiency of an electric motor?
- How does temperature affect the magnetic field strength of a permanent magnet?
- How does the diameter of coil on a battery copper coil train affect the speed of train?
- Confirm the relative permeability of free space by varying the current of a solenoid and measuring the resulting magnetic field
- How does the magnetic field strength of a permanent magnet affect it's levitation height when placed above another permanent magnet?

Physics IA Ideas: Circular Motion and Gravitation

- How does the rate of rotation of Foucault's pendulum depend on the latitude position of the pendulum?
- How does the magnetic field strength of the bar magnets in a DC Motor affect the angular velocity of the motor?

Physics IA Ideas: Energy Production

- How does temperature affect the output voltage of photovoltaic cells?
- How does the thickness of cellophane covering a solar panel affect the efficiency of the solar panel?
- How does the frequency of electromagnetic radiation (in the visible spectrum) affect the output energy from a solar panel?

Physics IA Ideas: Wave Phenomena

- How is the slit spacing produced from a laser dependent on the distance from the screen?
- How does the density of a liquid affect the angle subtended by the diffracted waves when the liquid is passed through a single slit in a ripple tank?
- How does the temperature of water in a wine glass affect the resonant frequency of sound produced when the wine glass is struck and the rim begins to freely vibrate?
- How does the volume of water in a wine glass affect the resonant frequency of sound produced when the wine glass is struck and the rim begins to freely vibrate?
- How does the cross-sectional area of card attached to a vibrating mass affect the displacement of the mass after twenty oscillations?
- How does the diameter of a wire affect the damping constant of a pendulum?
- How is the time period of oscillation of a solid sphere on a curved track affected by the radius of the solid sphere?
- How does the slit width of a single slit affect the maximum angle of visible diffraction for a monochromatic source?
- Does a pendulum obey the rules of SHM at large angles of release?
- How does light intensity vary when passed through a polaroid filter at different angles?
- How does the angle of incidence of p-polarised light affect the reflectivity of light?
- Determine the width of human hair using single slit diffraction

Physics IA Ideas: Fields

- How does the distance between two charged parallel plates affect the area of uniform electric field lines (taking into account distortion due to the edge effect)?
- Use Coulomb's Law to determine the number of excess electrons on a charged balloon
- Determine the mass of the electron experimentally, using an electron deflection tube.
- Determine the electric charge through the Millikan experiment

Physics IA Ideas: Electromagnetic Induction

- How is the e.m.f, ε(V), induced in a coil is affected by the height, s(m) the magnet is dropped through it?
- How does varying the frequency of rotation of a simple a.c. generator affect the induced peak e.m.f.
- How does the radius of a copper pipe affect the time taken for a magnet to drop through it?
- How does the voltage applied to a helmholtz coil (laid flat on the table) affect the period of a pendulum oscillating freely within the loop?
- How does the temperature affect the efficiency of a transformer?
- How does the resistivity of a metal pipe affect the time taken for a magnet to drop through it?
- How does the diameter of coil on a battery copper coil train affect the speed of train?
- Investigate the effect of connecting capacitors in series on the voltage across a discharging capacitor.
- How does the voltage across a capacitor affect the energy stored in the capacitor?
- How does temperature affect the efficiency of a diode bridge rectification circuit?

Physics IA Ideas: Quantum and Nuclear Physics

- Determine the spacing between the planes in the atomic lattice of graphite, using the de Broglie Relationship
- Determine the work function of a given metal

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Physics IA Ideas: Engineering Physics

- How does the density of an object fully immersed in water affect the time take to reach equilibrium, once released?
- How does the volume of an object immersed in water affect the buoyancy of the object?
- How does the mass of a body submerged in a fluid affect the volume displaced?
- How does the cross-sectional area of the pipe in a siphon affect the volumetric flow rate of the water in the siphon?
- How does the drop height of a water droplet affect the rebound height upon contact with a water surface?
- How does temperature affect the viscosity of castor oil?
- How does the moment of inertia affect the final velocity of a cylinder rolling down an inclined slope?

FURTHER HELP