IHSB STEM FEST 2026

Concern of INTERNATIONAL HOPE SCHOOL BANGLADESH

Dear Sir/Ma'am,

Warm greetings from the **IHSB STEM Fest Organizing Team** at **International Hope School Bangladesh** (IHSB)!

In the following document you will find the detailed information about our upcoming Event, the "**Hopians Physics Olympiad**."

Event Details:

Event Date: **23rd January 2026 (Friday) (Competition Day)**
24th January 2026 (Saturday) (Award Ceremony)

Registration Fee: Individual Competition - **BDT 500 ৳**

Registration Deadline: **10th January 2026**

Category Details:

The Event has been divided into THREE Categories

- **Middle – School Category** **(Grade: 06 – 08)**
- **Secondary Category** **(Grade: 09 – 10)**
- **Higher Secondary Category** **(Grade: 11 – 12)**

Competition Details:

- The **OLYMPIAD** Will Consist of **ONE ROUND.**
- The Use of **CALCULATOR** is **Allowed.**
- The Duration will be 50 Minutes.
- The questions will comprise of Multiple Choice Question (MCQ).
- Negative Markings **WON'T BE APPLIED** in Case of **INCORRECT ANSWERS**.
- Please Note that all the **OLYMPIADS QUESTION** will be **PRESENTED** in **ENGLISH**!
- **Top** 05 **Students from each Category will be** AWARDED!
  (May Vary Depending on Number of Participants)

*** Exclusive Invitation to the Award Ceremony will be extended solely to the TOP ACHIEVERS in recognition of their outstanding Performance. ***

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For any inquiries or queries related to the "**Hopians Physics Olympiad**," we encourage you to reach out to the designated contact points listed below:

Hopians Physics Olympiad
Event Affairs

Contact Details:
E-Mail: physics@ihsb.edu.bd

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STEM FEST Coordinator

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Our team is committed to assisting you and providing any necessary information or clarification. Your engagement and enthusiasm are integral to the success of the event, and we welcome the opportunity to address any questions you may have.

Thank you for your cooperation, and we eagerly anticipate your active participation in the **Hopians Physics Olympiad**.

Sincerely,

IHSB STEM Fest Organizing Team
Uttara Main Campus
INTERNATIONAL HOPE SCHOOL BANGLADESH

Middle-School Category Syllabus (Grade: 6 – 8)

1. Physical Quantities & Measurements

- Basic & Derived Physical Quantities.
- Measurement Tools & Techniques:
  - Measuring Mass with Balances.
- Units of Measurement (SI Units).
- Converting Units & Understanding Prefixes (Kilo, Milli, Micro, etc.)
- Errors in Measurements & their Types.

2. Motion & Forces

- Speed, Velocity, & Acceleration.
- Graphical Representation of Motion (Distance-Time & Velocity-Time Graphs).
- Newton's Laws of Motion:
  - First Law
  - Second Law
  - Third Law
- Simple Calculations Involving Motion.

3. Properties of Matter

- States of Matter: Solids, Liquids, & Gases.
- Mass, Volume, & Density:
  - Calculations of Density
- Pressure in Solids, Liquids, & Gases:
  - Atmospheric Pressure & its Variations.
- Buoyancy & Archimedes' Principle.

4. Energy, Work, & Power

- Forms of Energy: Kinetic, Potential, Thermal, & Electrical.
- Law of Conservation of Energy.
- Work: Definition & Calculation
- Power: Definition & Calculation
- Renewable & Non-Renewable Energy Sources.

5. Heat & Temperature

- Concept of Temperature & Heat.
- Scales of Temperature: Celsius, & Kelvin.
- Heat Transfer Methods:
  - Conduction.
  - Convection.
  - Radiation.
- Effects of Heat:
  - Expansion of Solids, Liquids, & Gases.
- Change of State (Melting, Boiling, Evaporation, Condensation).

6. Light & Optics

- Nature of light: Reflection and refraction.
- Laws of reflection and refraction (Snell's Law).
- Lenses and mirrors:
- Convex lenses and mirrors.
- Simple ray diagrams.
- Dispersion of light.

7. Sound

- Nature of Sound as a Wave.
- Properties of Sound:
  - Frequency, Wavelength, & Amplitude.
  - Speed of Sound in Different Mediums.
- Reflection of Sound: Echo.

Secondary Category Syllabus (Grade: 9 - 10)

1. Physical Quantities & Measurements

- Basic & Derived Physical Quantities.
- Measurement Tools & Techniques:
  - Measuring Mass with Balances.
- Units of Measurement (SI Units).
- Converting Units & Understanding Prefixes (Kilo, Milli, Micro, etc.).
- Errors in Measurements & their Types.

2. Motion & Forces

- Speed, Velocity, & Acceleration.
- Graphical Representation of Motion (Distance-Time & Velocity-Time Graphs).
- Newton's Laws of Motion:
  - First Law
  - Second Law
  - Third Law
- Simple Calculations Involving Motion.

3. Properties of Matter

- States of Matter: Solids, Liquids, & Gases.
- Mass, Volume, & Density:
  - Calculations of Density
- Pressure in Solids, Liquids, & Gases:
  - Atmospheric Pressure & its Variations.
- Buoyancy & Archimedes' Principle.

4. Energy, Work, & Power

- Forms of Energy: Kinetic, Potential, Thermal, & Electrical.
- Law of Conservation of Energy.
- Work: Definition & Calculation
- Power: Definition & Calculation
- Renewable & Non-Renewable Energy Sources.

5. Heat & Temperature

- Concept of Temperature & Heat.
- Scales of Temperature: Celsius, & Kelvin.
- Heat Transfer Methods:
  - Conduction
  - Convection
  - Radiation
- Effects of Heat:
  - Expansion of Solids, Liquids, & Gases.
  - Change of State (Melting, Boiling, Evaporation, Condensation).

6. Light & Optics

- Types of Waves: Transverse & Longitudinal.
- Wave Properties:
  - Amplitude, Frequency, Wavelength, Speed ($v=f\lambda$)
  - Nature of Light: Reflection & Refraction.
  - Laws of Reflection & Refraction (Snell's Law).
  - Lenses & Mirrors:
  - Convex Lenses & Mirrors.
  - Simple Ray Diagrams.
  - Dispersion of Light.

7. Sound

- Nature of Sound as a Wave.
- Properties of Sound:
  - Frequency, Wavelength, & Amplitude.
  - Speed of Sound in Different Mediums.
- Reflection of Sound: Echo.

8. Current Electricity

- Electric Current, Potential Difference, & Resistance.
- Ohm's Law ($V=IRV=IR$).
- Series & Parallel Circuits

9. Magnets & Magnetic Fields • Properties of Magnets. • Magnetic Effects of Current: • Magnetic Field Around a Straight Conductor, Loop, and Solenoid. • Electromagnetic Induction: Faraday's Law and Lenz's Law. • Electromagnets and Applications.	

Higher - Secondary Category Syllabus (Grade: 11 - 12)

1. Physical Quantities & Measurements

- SI Units, Prefixes, & Unit Conversions.
- Dimensional Analysis & its Applications.
- Measurement Tools:
  - Vernier Calipers, Micrometer Screw Gauge, & Stopwatch.
- Errors in Measurement:
  - Types (Systematic & Random Errors).
  - Accuracy, Precision, & Significant Figures.

2. Motion in One & Two Dimensions

- Scalars & Vectors: Addition, Subtraction, & Resolution of Vectors.
- Equations of Motion for Uniformly Accelerated Motion:
- Projectile Motion:
  - Horizontal & Vertical Components of Motion.

3. Dynamics

- Newton's Laws of Motion & Applications.
- Friction:
  - Static & Kinetic Friction.
  - Applications & Implications.
- Momentum:
  - Momentum & Impulse.
  - Law of Conservation of Momentum.

4. Energy, Work, & Power

- Work
- Kinetic & Potential Energy:
- Conservation of Energy.
- Power:
  - Definition & Calculation.
- Efficiency of Energy Transfer.

5. Properties of Matter

- States of Matter & their Properties.
- Density & Pressure:
  - Pressure.
  - Pressure in Fluids: Pascal's Principle & Applications (Hydraulic Press).
- Archimedes' Principle & Buoyant Force.
- Elasticity:
  - Stress, Strain, & Young's Modulus.

6. Thermal Physics

- Concept of Temperature & Heat.
- Scales of Temperature: Celsius, & Kelvin.
- Heat Transfer Methods:
  - Conduction.
  - Convection.
  - Radiation.
- Effects of Heat:
  - Expansion of Solids, Liquids, & Gases.
  - Change of State (Melting, Boiling, Evaporation, Condensation).
- Heat & Temperature: Differences & Measurement.
- Specific Heat Capacity:
- Change of State: Latent Heat.
- Thermal Expansion of Solids, Liquids, & Gases.

7. Waves & Oscillations

- Types of Waves: Transverse & Longitudinal.
- Wave Properties:
  - Amplitude, Frequency, Wavelength, Speed.
- Sound Waves:
  - Speed of Sound in Different Media.
  - Reflection, Refraction, & Diffraction of Sound.

8. Optics

- Reflection of Light:
  - Plane Mirrors.
  - Laws of Reflection & Image Formation.
- Refraction of Light:
  - Laws of Refraction (Snell's Law).
  - Total Internal Reflection & Critical Angle.
- Lenses:
  - Convex & Concave Lenses.
  - Applications for Optical Instruments.
- Dispersion of Light & the Spectrum.
- Polarization of Light.
- Malus's Law

9. Electricity & Magnetism

- Electric Charges & Fields:
- Electric Current:
  - Ohm's Law.
  - Series & Parallel Circuits.
  - Electrical Energy & Power.
- Magnetic Effects of Current:
  - Magnetic Field around a Straight Conductor, Loop, & Solenoid.
  - Electromagnetic Induction: Faraday's Law & Lenz's Law.
- Electromagnets & Applications.

10. Modern Physics

- Structure of the Atom: Electrons, Protons, & Neutrons.
- Radioactivity:
  - Alpha, Beta, & Gamma Decay.
  - Half-Life & Radioactive Decay Law.
- Basics of Nuclear Fission & Fusion.
  - Concept & Applications.

11. Experimental Skills

- Graph Plotting & Interpretation:
  - Linear & Non-Linear Graphs.
- Basic Laboratory Experiments:
  - Verifying Laws of Reflection & Refraction.
  - Measuring Acceleration Due to Gravity Using a Pendulum.
  - Constructing Simple Electric Circuits.
- Data Analysis & Error Estimation.