



BANGLADESH YOUTH ENVIRONMENTAL INITIATIVE

National Earth Olympiad

Syllabus

- The first round will contain 70 multiple choice questions, for total time of 60 minutes.
- For the first round, most of the questions will be general, and will test your basic knowledge in Earth Science.
- It is recommended that the book “High School Earth Science” from wikibooks is read. It is available for online reading and download from:
http://en.wikibooks.org/wiki/High_School_Earth_Science



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Environmental Studies

1. Renewable and Non Renewable Energy

Sources

2. Ecosystem

3. The Ecological Pyramids

4. Biodiversity

5. Air Pollution

6. Water Pollution

7. Soil Pollution

8. Marine Pollution

9. Noise Pollution

10. Thermal Pollution

11. Nuclear Accidents and Nuclear Holocaust

12. Ozone Layer Depletion

13. Acid Rain

14. Global Warming

15. Climate Change

16. Earth Summit

17. Agenda 21

18. Environmental Organization i.e. IPCC,

UNEP etc.

19. Environmental Personality i.e. Al Gore,

Wangari Maathai etc.

Astronomy

Observational Astronomy

1. Relative motion between the Sun, Moon

and Earth – Day and Night, Seasons,

Lunar Phases, Solar and Lunar Eclipses,

Calendar

2. Sky – Constellations, Bayer's designation of

stars, Celestial Coordinates (Right

ascension, declination), Ecliptic plane,

Precession

3. Planetary Observations – Conjunction,

Opposition, Greatest Elongation, Albedo

4. Stellar brightness and Color – Brightness,

Luminosity, Colour, Spectral Classification

5. Telescopes – Optics and Operation of Small

Telescopes, Radio Telescopes,



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Space Telescopes

Introduction to Solar System

1. Sun – Interior, Atmosphere, Sunspot
2. Terrestrial planets – Mercury, Venus, Earth, Mars
3. Outer planets/Gaseous Planet – Jupiter, Saturn, Uranus, Neptune
4. Dwarf planets
5. Comets
6. Asteroids
7. Satellites
8. Planetary Rings
9. Space Exploration in the Solar System

The Sun is a star

1. Nuclear fusion in the solar interior
2. The birth of the solar system
3. The concept of color-magnitude diagram (HR diagram)

The Earth in the Universe

1. The Earth in the solar system
2. The Sun in the Milky Way
3. The Milky Way in the Universe

Space Science

1. Thermosphere, magnetosphere, solar wind
2. The influence of solar surface activities to the Earth

Atmosphere

Basics and Energy of the Atmosphere:

1. Composition and History of Atmosphere
2. Physics of Atmosphere : Pressure, Density, Temperature, Ideal Gas Law, Hydrostatic Equilibrium, Energy, Heat and Sensible Heat, Heat Transfer, Radiation, Solar and Terrestrial Radiation
3. The Greenhouse Effect

Moisture, Clouds, and Precipitation:

1. Water and its three phases
1. Latent Heat
2. Hydrological Cycle
3. Humidity and its related variables
4. Saturation
5. Dew and Frost
6. Cloud Condensation Nuclei
7. Fog and its types



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8. Adiabatic warming/cooling

9. Clouds, Cloud Identification and Classification

10. Unusual Clouds

11. Atmospheric Stability

12. Inversion

13. Instability and Its causes

14. Buoyancy

15. Topographic Effect

16. Thermodynamic Diagrams

17. Precipitation Processes

18. Cloud Seeding

19. Precipitation types and formation mechanisms

Air Pressure and Motion:

1. Atmospheric pressure

2. Weather Maps

3. Newton's Law of Motion

4. Basic Forces acting on the Air

5. Atmospheric Motion (wind)

6. Winds produced by Balanced Forces

7. Surface Winds

8. Divergence and Convergence

9. Vertical Motion

10. Scales of Weather Systems

11. Synoptic-Scale Systems

12. Local wind systems (land-sea and mountain-valley breezes)

13. Katabatic winds

14. Feohn

15. Small-Scale winds

16. Turbulence and eddies

Weather Systems and Patterns:

1. Air masses and their classification

2. Fronts and their types

3. Upper-air fronts

4. Jet streams

5. Polar front theory

6. Extratropical cyclones

7. Upper-level waves and surface storms

8. Tropical cyclones (hurricanes) and their classification

9. Mesoscale convective systems

10. Local thunderstorms



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11. Floods

12. Cloud electrification and lightning

13. Tornadoes and the damaging scale

14. Waterspouts

15. Convective cells

Climate and Climate Change:

1. Mean temperature and pressure patterns

2. General circulation

3. Precipitation (Rainfall) patterns

4. Polar front and subtropical jets

5. Monsoon

6. Atmosphere-Ocean interaction

7. Ocean currents and upwelling

8. El Niño and the Southern Oscillation

9. Climate patterns and classification

10. Climate change and its causes

11. Past climate

12. Global warming and its consequences

13. Air pollution and aerosols

14. Climate-related environmental issues

Observations, Weather Forecasts, and

Atmospheric Optics:

1. Instrument shelter

2. Thermometers

3. Barometers

4. Hygrometers

5. Psychrometer

6. Rain Gauges

7. Anemometers

8. Radiosonde

9. Dropsonde

10. Sky conditions

11. Remote sensing of weather

12. Satellite and RADAR observations

13. Rainfall estimates

14. Doppler effect and Doppler radar

15. Acquisition of weather data, Conventional and Unconventional data

16. Forecasting methods and Tools

17. Uncertainty and Predictability

18. Probability forecasts

19. Reflection and Refraction

20. Scattering

21. Transmission



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22. Color of objects

23. Aurora

24. Twinkling

25. Twilight

26. The green flash

27. Mirage

28. Halos

29. Sundogs

30. Sun pillars

31. Rainbows

32. Coronas

Hydrosphere

Hydrography

1. Water temperature

2. Water depth

3. Water density

4. Salinity

5. Sea level

6. Pressure

7. T-S diagram

8. Mixing layer

9. Sound velocity in ocean

10. Color of sea water

11. Nutrients in ocean

12. Dissolved oxygen

13. Light intensity in ocean

14. Altimeter

15. Evaporation

16. Precipitation

17. River runoff

Current

1. Geotropic Current

2. Eddy

3. Coriolis Force

4. Sea surface dynamic topography

5. Thermohaline circulation

6. Friction force

Tide

1. Semi-diurnal tide

2. Diurnal tide

3. Neap tide

4. Spring tide

5. Equilibrium theory of tide

6. Tide-generating force



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7. Low water
8. High water
9. Tidal range

Wave

1. Wave height
2. Wave period
3. Wave length
4. Wave speed in shallow water
5. Wave speed in deep water
6. Tsunami

Geosphere

Mineral & Rocks

1. Identification of selected minerals from the list (Appendix 1).
2. Classification of selected rocks from the list (Appendix 1).
3. Identification of reefal limestones and reef-building organisms.

Historical Geology (sedimentology, paleontology, stratigraphy, paleo-global change)

1. Sedimentary structure and interpretation and Geological records in global change.

Principle of plate tectonics and its application.

Plate tectonics & Seismology

1. Crustal deformation and its relation to earthquakes.
2. Principle of seismology and related calculation.

Physical Geography

1. Physical Geography (geomorphology, climatology, hydrology, soil geography, major vegetation zones): landform vs. process, landform vs. geological structures, basic hydrology.
2. Soil Development and Identification of major soil types,
3. Landscape Identification