BANGLADESH YOUTH ENVIRONMENTAL INITIATIVE

Syllabus for NEO'20

- The syllabus for NEO'20 is based on the textbook "High School Earth Science" and "Meteorology Today" (by C. Ahrens). You can find the book "High School Earth Science" on wikibooks.org, or byei.org/neo.
- The syllabus may seem very big, but don't be scared! It will get easier as you study.
- Try to cover as many sections for the exam as possible.
- Read the **Lesson Summary** at the end of every section to get a basic idea of all concepts.
- Other books you can study are-
    - "Earth: Portrait of a Planet" by Stephen Marshak
    - "Understanding Earth" by John Grotzinger and Thomas H. Jordan

High School Earth Science

Geosphere

Chapter 2: Studying Earth's Surface

2.1 Introduction to Earth's Surface Direction
Topography
Landforms
Continents
Ocean Basins
2.2 Modeling Earth's Surface
Map Coordinates
Globe
2.3 Topographic Maps
What is a Topographic Map?
2.4 Using Satellites
Satellite Images

Chapter 3: Earth's Minerals

3.1 What are Minerals?
What are Minerals?
Groups of Minerals (common minerals with chemical formula)
3.2 Identification of Minerals
All
3.3 Formation of Minerals
Formation from Magma and Lava Formation from Solutions Minerals from Salt Water

Chapter 4: Rocks

4.1 Types of Rocks
The Rock Cycle
Three Main Categories of Rocks
Processes of the Rock Cycle
4.3 Sedimentary Rocks
Concept of Sediments
4.4 Metamorphic Rocks
Concept of Metamorphism

Chapter 6: Plate Tectonics

6.1 Inside Earth
Exploring Earth's Interior
Concept of Crust, Lithosphere, Mantle and Core
6.2 Continental Drift
The Continental Drift Idea
6.3 Seafloor Spreading
The Seafloor Spreading Hypothesis
6.4 Theory of Plate Tectonics
Earth's Tectonic Plates
How Plates Move
Plate Boundaries

Chapter 7: Earthquakes

7.1 Stress in the Earth's Crust Causes and Types of Stress Concept of Folds and Faults Stress and Mountain Building
7.2 Nature of Earthquakes
Causes of Earthquakes
Earthquake Zones
Tsunami
7.3 Measuring and Predicting Earthquakes
Basic idea of Magnitude and Intensity
7.4 Staying Safe in Earthquakes
All

Chapter 8: Volcanoes

8.1 Volcanic Activity
All
8.2 Volcanic Eruptions
Concept of Magma and Lava
8.4 Volcanic Landforms and Geothermal Activity
Basic idea of geothermal activity

Chapter 9: Weathering and Formation of Soil

9.1 Weathering
What is Weathering?
9.2 Soils
Formation

Chapter 10: Erosion and Deposition

10.1 Water Erosion and Deposition
Stream and River Erosion – Stages of Streams Stream and River Deposition
10.2 Wave Erosion and Deposition
Basic Idea of Wave Erosion and Deposition Protecting Shorelines
10.4 Glacial Erosion and Deposition
Basic idea of Glacial Erosion and Deposition
10.5 Erosion and Deposition by Gravity Contributing Factors Landslide
Prevention and Awareness of Landslide

Chapter 11: Evidence About Earth's Past

11.1 Fossils
How Fossils Form
What are index fossils?
Fossils Clues from Fossils
11.2 Relative Ages of Rocks
Superposition of Rock Layers
Original Horizontality
Lateral Continuity
Superposition Cross-Cutting Relationships
11.3 Absolute Ages of Rocks
Age of Earth
Radioactive Decay
Carbon Dating

Chapter 12: Earth's History

12.1 Geologic Time Scale
Geologic Time
Geologic Time Scale
12.2 Early Earth
All
12.3 History of Earth's Life Forms
Earth's Diversity
Adaptations and Evolution

BANGLADESH YOUTH ENVIRONMENTAL INITIATIVE

Hydrosphere

Chapter 13: Earth's Fresh Water

13.1 Full Section
13.2 Surface water
Stream and river
Floods
13.3 Ground water

Chapter 14: Earth's Oceans

14.1 Full; only a basic concept of water columns required.
14.2 Full; only a basic concept of surface and deep currents required.
14.3 Full; Features of sea floor **NOT** included.

Chapter 21: Human Actions and Earth's Waters

Full Chapter; "California Water Resources" from Section 21.1 is **NOT** included.

Atmosphere

Chapter 15: Earth's Atmosphere

15.1
Significance of the Atmosphere
Composition of Air
Pressure and Density
15.2 15.3 15.4
Only basic concepts of all sections

Chapter 16: Weather

16.1
Basic concepts of all
16.2
Basic
16.3
Thunderstorms, Tornadoes, Cyclones, Extreme Heat and Drought
16.4
Basic idea of barometer

Chapter 17: Climate

17.1
What is Climate?
Latitude
Altitude and Mountain Ranges
17.2
Very basic ideas
17.3
Short-Term Climate Oscillations (terms only) Causes of Climate Change
Solar Variation
Plate Tectonics
Asteroid Impacts
Rising Atmospheric Greenhouse Gases Global Warming

Chapter 22: Human Actions and the Atmosphere

All

Planetary Science

Chapter 23: Observing and Exploring Space

23.1 Telescopes
- Electromagnetic Radiation
- The Speed of Light
- Light-Years
- Looking Back in Time
- The Electromagnetic Spectrum
- Keplers Law

Chapter 24: Earth, Moon, and Sun

24.1 Planet Earth Full
24.2 Earth's Motions Full
24.3 Earth's Moon
- How the Moon Formed
- Lunar Characteristics
- The Lunar Surface

24.4 The Sun
- The Sun's 'Atmosphere'

24.5 The Sun and the Earth-Moon System
- Earth's Seasons
- Solar Eclipses
- Lunar Eclipse
- The Phases of the Moon
- The Tides

Chapter 25: The Solar System

25.1 Introduction to the Solar System
- Geocentric-Heliocentric
- Universe Table 25.1
- What Is (and Isn't) a Planet?
- The Size and Shape of Orbits
- The Role of Gravity
- A Giant Nebula

25.2 Inner Planets – Basics
25.3 Outer Planets – Basics
25.4 Other Objects in the Solar System
- The Asteroid Belt
- Meteoroids
- Meteorites
- Comets
- Dwarf Planets

Environmental Sciences

Chapter 5: Earth's Energy

- Energy Resources
- Types of Energy Resources
- Types of Renewable Resources
- Nonrenewable Energy Resources
- Formation of Fossil Fuels
- Coal, oil, Natural Gas
- Problems with Fossil Fuels
- Nuclear Energy
- Solar Energy
- Water Power
- Wind Power
- Biomass
- Geothermal Energy

Chapter 18: Ecosystems and Human Populations

- Ecosystems
- Biological Communities
- Flow of Energy in Ecosystems
- Relationships Between Species
- The Carbon Cycle and the Nitrogen Cycle
- Short Term Cycling of Carbon
- Long Term carbon cycle
- Carbon Sinks and Carbon Sources
- Human Actions Impact the Carbon Cycle
- Why Do We Need to Know About the Carbon Cycle?
- The Nitrogen Cycle
- Human Populations
- Human Population Growth
- Humans and the Environment
- Sustainable Development

Chapter 19: Human Actions and the Land

- Loss of Soils
- Causes of Soil Erosion
- Human-caused Erosion
- Preventing Soil Erosion
- Pollution of the Land
- What is Hazardous Waste?
- Impacts of Hazardous Waste

Chapter 20: Human Actions and Earth's Resources

- Use and Conservation of Resources
- Renewable versus Non-Renewable Resources
- Common Materials We Use From the Earth
- Human Population and Resource Use
- Resource Availability
- Conserving Natural Resources
- Obtaining Energy
- Energy Efficiency

Chapter 21: Human Actions and Earth's Waters

- Humans and the Water Supply
- Problems with Water Distribution
- Water Pollution
- Protecting the Water Supply

Chapter 22: Human Actions and the Atmosphere

- Air Pollution
- Effects of Air Pollution
- Reducing

Meteorology Today (12th Edition)

Chapter 1: Earth and Its Atmosphere

- Composition of Today's Atmosphere
- Vertical Structure of the Atmosphere
- The Atmospheres of Other Planets
- Weather and Climate in Our Lives

Chapter 2: Energy

- Energy, Temperature, and Heat
- Temperature Scales
- Specific Heat
- Latent Heat
- Heat Transfer in the Atmosphere: Conduction and Convection
- Radiation
- Global Warming and Enhancement of the Greenhouse Effect

Chapter 3: Seasonal and Daily Temperatures

(Full Chapter including the Focus sections)

Chapter 4: Atmospheric Humidity

- The Many Phases of Water
- Humidity
  - Absolute Humidity
  - Specific Humidity
  - Vapor Pressure
  - Relative Humidity
  - Dew Point
  - Measuring Humidity

Chapter 5: Condensation: Dew, Fog, and Clouds

- Dew
- Fog (Radiation fog, advection fog, mixing fog)
- Haze
- Condensation Nuclei
- Clouds (Just the intro, no need to memorize the identification of different types of clouds)

Chapter 6: Stability and Cloud Development

(Full Chapter including the Focus sections)

Chapter 7: Precipitation

- Precipitation Processes
  - How Do Cloud Droplets Grow Larger?
  - Cloud Seeding and Precipitation
  - Precipitation in Clouds
- Precipitation Types
  - Rain
  - Snow
  - Sleet and Freezing Rain

Chapter 8: Air Pressure and Winds

- Atmospheric Pressure:
  - Horizontal Pressure Variations
  - Daily Pressure Variations
  - Pressure Measurements
- Forces That Influence the Winds:
  - Pressure-Gradient Force
  - Coriolis Force
  - Geostrophic Winds
  - Surface Winds
- Winds and Vertical Air Motions

Chapter 13: Weather Forecasting

- Weather Observations
- Weather Forecast Tools
- Weather Forecast Methods
- Using Forecasting Tools to Predict the Weather

Chapter 14: Thunderstorm

- Thunderstorm Types
- Thunderstorm and Flooding
- Lightning and Thunder

Chapter 15: Tornadoes

- Tornado Life Cycle
- Tornado Formation
  - Supercell Tornadoes
  - Nonsupercell Tornadoes
  - Watespouts

Chapter 16: Hurricanes

- Tropical Weather
- Hurricane Formation and Dissipation
- Hurricane Movement

Chapter 17: Global Climate

- Climatic Classification
- Global Pattern of Climate
  - Tropical Moist Climates
  - Dry Climates
  - Moist Subtropical Mid-Latitude Climates
  - Moist Continental Climates
  - Highland Climates